MATERIAL SAFETY DATA SHEET OF
DIFENOCONAZOLE 25% EC

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY

Supplier: SHANGHAI MINGDOU AGROCHEMICAL CO., LTD
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Product name: Difenoconazole 25% EC
Product use: Fungicide

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formulation Type: Emulsifiable concentrate
Active Ingredients: Difenoconazole
Chemical Abstracts name: 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole
IUPAC name: cis,trans-3-chloro-4-[4-methyl-2-(1H,1,2,4-triazol-1-ylmethyl)-1,3-dioxolan-2-yl]phenyl 4-chlorophenyl ether
Chemical Family: triazole
CAS NO. 119446-68-3
Molecular Formula: C_{19}H_{17}Cl_{2}N_{3}O_{3}
Molecular Weight: 406.3
Structural Formula:

```
O
O
CH_3

Cl

O

Cl

CH_2

N

N

N
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Composition:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NO</th>
<th>PROPORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difenoconazole</td>
<td>119446-68-3</td>
<td>25% Min</td>
</tr>
<tr>
<td>Inert ingredients</td>
<td>Not available</td>
<td>75% Max</td>
</tr>
</tbody>
</table>

Other ingredients determined not to be hazardous
3. HAZARDS IDENTIFICATION

Emergency overview: Warning! Irritating to eyes and skin. Avoid contact with eyes and skin. Do not inhale spray mist. Vapors may cause drowsiness and dizziness.

Physical hazards: This product is non-flammable and non-explosive. Product is combustible. May decompose at high temperatures forming toxic gases.

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

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.

Inhalation: Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Keep patient warm and at rest. Call a physician or Poison Control Centre immediately.

Skin contact: Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Ingestion: If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting: contains petroleum distillates and/or aromatic solvents.

Note to physician: No specific antidote. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash point: 66 - 67°C (closed cup)

Flammable limits:
LFL: Not determined.
UFL: Not determined.

Autoignition temperature: Not determined.

Hazardous combustion products: As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health. Flash back possible over considerable distance.

Extinguishing media: Small fires - Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Large fires - Alcohol-resistant foam.

Media to be avoided: Do not use a solid water stream as it may scatter and spread fire.
Fire-fighting instructions: Do not allow run-off from fire fighting to enter drains or water courses. Cool closed containers exposed to fire with water spray.

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

6. ACCIDENT RELEASE MEASURES

Personal precautions: Refer to protective measures listed in sections 7 and 8.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Method for cleaning up: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations (see section 13).

7. HANDLING AND STORAGE

Handling: Read the label before use. No special protective measures against fire required. Avoid contact with skin and eyes. When using, do not eat, drink or smoke. For personal protection see section 8.

Storage: No special storage conditions required. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep away from food, drink and animal feeding stuffs. Physically and chemically stable for at least 2 years when stored in the original unopened sales container at ambient temperatures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits: difenoconazole 8 mg/m$^3$ 8 h TWA

Engineering controls: Containment and/or segregation is the most reliable technical protection measure if exposure cannot be eliminated. The extent of these protection measures depends on the actual risks in use. If airborne mists or vapors are generated, use local exhaust ventilation controls. Assess exposure and use any additional measures to keep airborne levels below any relevant exposure limit.

Personal protective equipment (PPE):

Respiratory protection: A combination gas, vapor and particulate respirator may be necessary until effective technical measures are installed. Protection provided by air-purifying respirators is limited. Use a self-contained breathing apparatus in cases of emergency spills, when exposure levels are unknown, or under any circumstances where air-purifying respirators may not provide adequate protection.

Hand protection: Chemical resistant gloves should be used. Gloves should be certified to an appropriate standard. Gloves should have a minimum breakthrough time that is appropriate to the duration of exposure. The breakthrough time of gloves varies according to the thickness, material and manufacturer. Gloves
should be changed when breakthrough is suspected. Suitable material: Nitrile rubber.

Eye protection: If eye contact is possible, use tight-fitting chemical safety goggles and a face shield.

Skin and body protection: Assess the exposure and select chemical resistant clothing based on the potential for contact and the permeation/penetration characteristics of the clothing material. Wash with soap and water after removing protective clothing. Decontaminate clothing before re-use, or use disposable equipment (suits, aprons, sleeves, boots, etc.) Wear as appropriate: impervious protective suit

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Yellow to brown liquid.
Odor: Non-specific.

\[ \text{pH: } 5.0 \text{~} \text{to} \text{~} 8.0. \]

\[ \text{Density: } \text{Approx. } 1.07 \text{ g/cm}^3 \text{ at } 20 \text{ °C.} \]

Solubility in water: Miscible.
Corrosiveness: Non-corrosive

10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal conditions.
Conditions to avoid: Very high or low temperatures.
Hazardous decomposition: Combustion or thermal decomposition will evolve toxic and irritant vapors.
Incompatible materials: Strong oxidizing agents.
Hazardous reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Oral: \[ \text{LD}_{50} \text{ female rat, } 3,129 \text{ mg/kg}. \]
Dermal: \[ \text{LD}_{50} \text{ male and female Rat, } > 5,000 \text{ mg/kg} \]
Inhalation: \[ \text{LC}_{50} \text{ male and female rat, } > 2.0 \text{ mg/l} \]

Irritant properties:

Skin: Rabbit: Slightly Irritating
Eye: Rabbit: Moderately Irritating

Allergenic and sensitizing effects: Not considered to be a skin sensitizer (Guinea pig).
Long term toxicity: Did not show carcinogenic, teratogenic or mutagenic effects in animal experiments.

12. ECOLOGICAL INFORMATION

The following information is for the active ingredient, Difenoconazole.
Ecotoxicity:

**Birds**  
Acute oral LD$_{50}$: for mallard ducks >2150, Japanese quail >2000 mg/kg.  
Dietary LC$_{50}$ (5 days): for bobwhite quail 4760, mallard ducks >5000 ppm.

**Fish**  
LC$_{50}$ (96 h): for rainbow trout 0.81, bluegill sunfish 1.2, sheepshead minnow 0.82 mg/l.

**Daphnia**  
EC$_{50}$ (48 h): 0.77 mg/l.

**Algae**  
EC$_{50}$ (72 h): for *Scenedesmus subspicatus* 0.032-1.2 mg/l.

**Bees**  
Non-toxic to honeybees.  
LD$_{50}$ (oral): >100 μg/bee.  
LD$_{50}$ (contact): >100 μg/bee.

**Earthworm:**  
LC$_{50}$ (14 days): for earthworms >610 mg/kg.

**Persistence and degradability:** Difenoconazole is persistent in water. Difenoconazole is not persistent in soil.

**Bioaccumulative potential:** Difenoconazole has high potential to bioaccumulate.

**Mobility in soil:** Difenoconazole has low mobility in soil.

13. **DISPOSAL CONSIDERATION**

Product: Do not contaminate ponds, waterways or ditches with chemical or used container. Do not dispose of waste into sewer. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.

Contaminated packaging: Empty remaining contents. Triple rinse containers. Empty containers should be taken for local recycling or waste disposal. Do not re-use empty containers.

14. **TRANSPORT INFORMATION**

**UN Number:** 3082

**UN Proper shipping name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS DIFENOCONAZOLE 25%)

**Transport hazard class:** 9

**Packing group:** III

**Marine pollutant:** Yes

15. **REGULATORY INFORMATION**

**Hazard symbols:**

N Dangerous for the environment

**Risk phrases:**

R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety phrases:

S 2 Keep out of the reach of children.
S13 Keep away from food, drink and animal feeding stuffs.
S20/21 When using do not eat, drink or smoke.
S35 This material and its container must be disposed of in a safe way.
S57 Use appropriate container to avoid environmental contamination.

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