MATERIAL SAFETY DATA SHEET OF
QUIZALOFOP-P-ETHYL 125 G/L EC

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY
Supplier: SHANGHAI MINGDOU AGROCHEMICAL CO., LTD
Address: Rm.1210, Zhenyuan Building, No. 2052 North Zhongshan Rd, Shanghai, China
FAX: +86 21 52912097, 61638378
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Product name: Quizalofop-p-ethyl 125 G/L EC
Product use: Herbicide

2. COMPOSITION/INFORMATION ON INGREDIENTS
Formulation Type: Emulsifiable concentrate
Active Ingredients: Quizalofop-p-ethyl
IUPAC name: ethyl (R)-2-[4-(6-chloroquinoxalin-2-yloxy)phenoxy]propionate
Chemical Family: aryloxyphenoxypropionate
CAS NO. 100646-51-3
Molecular Formula: C_{19}H_{17}ClN_{2}O_{4}
Molecular Weight: 372.8
Structural Formula:

Composition:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NO</th>
<th>PROPORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizalofop-p-ethyl</td>
<td>100646-51-3</td>
<td>125 G/L Min</td>
</tr>
<tr>
<td>Inert ingredients</td>
<td>Not available</td>
<td>Up to 100%</td>
</tr>
</tbody>
</table>

Other ingredients determined not to be hazardous

3. HAZARDS IDENTIFICATION
Emergency overview: DANGER! Causes irreversible eye damage. Harmful if swallowed, inhaled, or absorbed through the skin. Avoid contact with eyes, skin, or clothing. Avoid breathing vapor or spray mist.
Routes of entry: Ingestion, inhalation, contact with skin and eyes.

Health hazards:
Eye contact: May cause eye irritation with tearing, pain or blurred vision.
Skin contact: May cause skin irritation with itching, burning, redness, swelling or rash.
Inhalation: May cause irritation of the nose and throat with sneezing, sore throat or runny nose.
Ingestion: May cause lung damage if swallowed.

Physical hazards: Combustible. Keep away from heat, sparks, and open flames. Keep container closed. Vapor forms explosive mixture with air. Heating can release vapors which can be ignited.

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

Skin contact: 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.

Eye contact: Hold eye 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 eye. Call a poison control center or doctor for treatment advice.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

Inhalation: Move person to fresh air. If person is not breathing, call an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Note to physician: No specific antidote. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash point: 98.9 ºC (Setaflash)
Flammable limits: Not determined.
Autoignition temperature: Not determined.

Hazardous combustion products: Combustion may release carbon dioxide, nitrogen oxides, and/or chlorine compounds.
Extinguishing media: Water Spray, Foam, Dry Chemical, CO₂.

Media to be avoided: None known.

Fire-fighting instructions: Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Use water spray. Cool tank/container with water spray.

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

**6. ACCIDENT RELEASE MEASURES**

**Personal precautions:** Wear protective equipment to prevent skin and eyes being affected. Evacuate unprotected and unnecessary personnel from area of spill. If material is leaking from a container, stop the leak only if this can be done safely.

**Environmental precautions:** Prevent spillage entering drains or watercourse.

**Method for cleaning up:** Vermiculite, Sand, Soil is a suitable absorbent, especially soils high in clay. Soil can be used to form bunds to contain spillage. Contaminated soil should be collected for disposal at a suitable landfill. Contaminated area and tools should be washed down with hypochlorite bleach. Personal protective equipment and clothing should be washed with soapy water.

**7. HANDLING AND STORAGE**

**Handling:** Read the label before use. Do not get in eyes. Avoid breathing vapors or mist. Avoid contact with skin. 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 personal protective equipment immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**Storage:** Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Store in a cool, dry place.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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

**Engineering controls:** Use only with adequate ventilation. Keep container tightly closed.

**Personal protective equipment (PPE):**

Skin protection: Long-sleeved shirt and long pants. Chemical-resistant gloves, such as barrier laminate or Viton. Shoes plus socks.

Eye protection: Protective eyewear.

**User safety recommendations:** Users should remove clothing immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. Remove personal protective equipment immediately after...
handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Dark amber liquid.
Odor: Aromatic.
Solubility in water: Emulsifies.
Specific gravity: Approx. 1.02
pH: 5.6 (1% wt/wt in water)
Freezing/Melting Point: No specific data. Liquid at normal temperatures.
Boiling Point: Not available.

10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal conditions.
Conditions to avoid: Very high or low temperatures.
Hazardous decomposition: Oxides of nitrogen and chlorine. Burning with limited oxygen may produce carbon monoxide.
Incompatible materials: Strong oxidizing agents.
Hazardous reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:
Oral: $\text{LD}_{50}$ 5900 mg/kg (rat-male), 4100 mg/kg (rat-female).
Dermal: $\text{LD}_{50} > 2000$ mg/kg (rabbit).
Inhalation: $\text{LC}_{50} > 2.0$ mg/l (rat).

Irritant properties:
Skin: Moderate irritant.
Eye: Severe irritant.

Allergic and sensitizing effects:
Not considered to be a skin sensitizer (Guinea pig).

Chronic toxicity: In a 1-year feeding study on dogs, doses of up to 10 mg/kg/day (the highest dose tested in that study) caused no observed effects. In a 90-day feeding study in rats, doses of 6.4 mg/kg/day and higher produced liver lesions and increased liver weight. In a 2-year study of rats, doses of 5 mg/kg/day produced no observed effects.

Carcinogenicity: In an 18-month carcinogenicity study on mice, increased liver weights, changes in blood
chemistry, and some changes in liver tissue structure were detected, but no carcinogenic or tumour-causing activity was reported. This study suggests that this compound is not carcinogenic.

**Teratogenic effects:** In a two-generational study in rats, doses of 2.5 mg/kg/day and higher produced increased liver weights in offspring. No teratogenic effects were observed in another study in rats at doses of up to 300 mg/kg/day (the highest doses tested) over an unspecified period, although maternal decreases in body weight, food consumption, and corpora lutea were observed at doses of 100 mg/kg/day.

**Genetic effects/Mutagenicity:** The results of many assays for mutagenicity and genotoxicity of quizalofop-p-ethyl show no mutagenic or genotoxic activity.

**Reproductive effects:** Data from reproductive studies indicated only decreased body weight gains, and did not report findings of impaired reproductive function in test animals.

12. **ECOLOGICAL INFORMATION**

The following information is for the active ingredient, Quizalofop-p-ethyl.

**Ecotoxicity:**

Birds  
Acute oral LD$_{50}$: for mallard ducks and bobwhite quail >2000 mg/kg.

Fish  
LC$_{50}$ (96 h): for rainbow trout >0.5 mg/l.

Daphnia  
EC$_{50}$ (48 h): 0.29 mg/l.

Bees  
LD$_{50}$ (oral): >100 μg/bee.

LD$_{50}$ (contact): >100 μg/bee.

Earthworm:  
LC$_{50}$ (14 days): >1000 mg/kg soil.

**Persistence and degradability:** Quizalofop-p-ethyl is moderately persistent in soils, with a reported half-life of 60 days. It may be more rapidly broken down in soil with high microbial activity.

**Bioaccumulative potential:** BCF (Bio-concentration factor) = 380. Quizalofop-p-ethyl has potential to bio-concentration.

**Mobility in soil:** Quizalofop-p-ethyl is moderately to strongly sorbed to soils, and studies indicate very low soil mobility. It should not leach significantly into water.

13. **DISPOSAL CONSIDERATION**

Product disposal: Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container disposal: Triple rinse (or equivalent) container. Then offer the container for recycling or reconditioning, or puncture and dispose of n a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke. Do not contaminate water when cleaning container or disposing of container wash waters.
14. TRANSPORT INFORMATION
UN Number: 3082
UN Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Quizalofop-p-ethyl)
Transport hazard class: 9
Packing group: III
Marine pollutant: Yes

15. REGULATORY INFORMATION
Hazard symbols:
   Xn Harmful
   Xi Irritating
   N Dangerous to the environment.
Risk phrases:
   R20/22 Harmful by inhalation and if swallowed.
   R38 Irritating to skin.
   R41 Risk of serious damage to eyes.
   R51/53 Toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.
   R65 Harmful: May cause lung damage if swallowed.
Safety phrases:
   S20/21 When using do not eat or drink/smoke.
   S23 Do not breathe spray.
   S24/25 Avoid contact with skin/eyes.
   S61 Avoid release to the environment. Refer to special instructions/Safety Data sheets.

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