



## MATERIAL SAFETY DATA SHEET

### Manufacturer/information service:

ZHEJIANG RAYFULL CHEMICALS CO., LTD.

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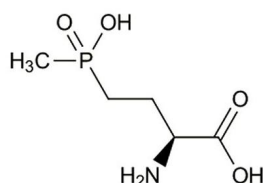
### 1. Chemical Product Identification

Product Name: Glufosinate-P 90% TC

Molecular Formula: C<sub>5</sub>H<sub>12</sub>NO<sub>4</sub>P

Molecular Weight: 181.13 g/mol

Structural Formula:



Chemical Name: (2S)-2-amino-4-[hydroxy(methyl)phosphinoyl]butyric acid

Form: Powder

Colour: White

### 2. Composition / Information on Ingredients

Composition	CAS No.	Content
Glufosinate-P	35597-44-5	90%
Other ingredients	---	10%

### 3. Hazards Identification

Harmful in contact with skin and if swallowed. Irritating to eyes. May impair fertility. Possible risk of harm to the unborn child. Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Keep out of reach of children. Keep away from food, drink, and animal feeding stuffs. Avoid



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contact with skin and eyes. Wear suitable protective clothing, gloves and eye/face protection. If swallowed, seek medical advice immediately and show this container or label.

#### **4. First Aid Measures**

**Eye:** 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 physician or poison control center immediately.

**Skin:** Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

**Ingestion:** Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

**Inhalation:** Move to fresh air. If person is not breathing, call an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

#### **5. Fire-Fighting Measures**

**Extinguishing media:** Suitable extinguishing media: Water spray; Foam; Carbon dioxide (CO<sub>2</sub>); Dry powder.

**Special hazards arising from the substance or mixture:** In the event of fire the following may be released: Hydrogen cyanide (hydrocyanic acid); Carbon monoxide (CO); Oxides of phosphorus; Sulphur oxides; Nitrogen oxides (NO<sub>x</sub>).

**Advice for firefighters:** Special protective equipment for fire-fighters: In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus.

**Further information:** Contain the spread of the fire-fighting media. Do not allow run-off from fire fighting to enter drains or water courses.

#### **6. Accidental Release Measures**

**Emergency procedures:** Isolate and post spill area. Wear as a minimum, cotton overalls buttoned to the neck and wrist (or equivalent clothing) and a washable hat, elbow length PVC or nitrile gloves and face shield or goggles. Large spills should be dyked or covered to



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prevent dispersal. Vacuum, shovel or pump spilled material into an approved container and dispose of as listed below. Keep out unprotected persons and animals.

Material and methods for containment and cleanup procedures: To decontaminate spill area, tools and equipment, wash with detergent and water and add the solution to the drums of wastes already collected and label contents. Absorb, as above, any excess liquid and add both solutions to the drums of waste already collected. Dispose of drummed wastes, including decontamination solution in accordance with the requirements of Local or State Waste Management Authorities. Do NOT allow spilled product or wash solution to enter sewers, drains, dams, creeks or any other waterways.

## 7. Handling and Storage

Handling: Do not get in eyes, on skin or clothing. Avoid breathing vapors or mist. Wash thoroughly after handling. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material. Wash clothing before use.

Storage: Keep container tightly closed. Keep container in a cool, dry, well-ventilated area away from food, feeds, seed and other agricultural remedies.

## 8. Exposure Controls/Personal Protection

Biological Limit Values: No biological limit allocated.

Engineering controls: Keep containers closed when not in use. No special engineering controls are required, however make sure that the work environment remains clean and that vapours and mists are minimised.

Personal Protective equipment (PPE):

Skin: When opening the container, preparing spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist (or equivalent clothing) and a washable hat, elbow length PVC or nitrile gloves and face shield or goggles.

Eye protection: Eye/face protection is recommended such as a face shield or goggles.

Respiratory Protection: Generally not required. Use of a respirator may be required in certain circumstances to protect from inhalation of spray mist.

## 9. Physical and Chemical Properties

Appearance: White powder

Odour: Characteristic



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pH: 2.0-5.0

Melting point: 230°C

Octanol-water partition coefficient at pH 7, 20 °C: Log P=-3.96

Dissociation constant pKa) at 25 °C: 2.0

## 10. Stability and Reactivity

Chemical Stability: Product is considered stable in ambient conditions for a period of at least 2 years after manufacture.

Conditions to avoid: Do not store for prolonged periods in direct sunlight.

Incompatible materials: Keep away from strong alkali.

Hazardous decomposition products: Product is unlikely to decompose until heated to dryness. On further heating will emit toxic fumes.

Hazardous reactions: Mixing with strong alkali (eg. Caustic soda) will cause the release of ammonia vapour. Polymerisation is unlikely.

## 11. Toxicological Information

Acute oral LD<sub>50</sub> for rats is >2000 mg/kg

Acute dermal LD<sub>50</sub> for rats is >5000 mg/kg

Acute inhalation toxicity LC<sub>50</sub> (4 h) for rats is 4.42 mg/L

Skin irritation: Non-irritating to skin of rabbits

Eye irritation: Non-irritating to eyes of rabbits

Skin Sensitization: Not a skin sensitiser (guinea pigs)

## 12. Ecological and Ecotoxicological Information

Effect on birds: Acute oral LD<sub>50</sub> for Japanese quail is >2000 a.i.mg/kg.

Effect on fish: Acute LC<sub>50</sub> (96 h) for Rainbow trout is 27.0 a.i.mg/L.

Effects on aquatic invertebrates: Acute EC<sub>50</sub> (48 h) for Daphnia magna is 15.0 a.i.mg/L.

Effects on algae: Acute EC<sub>50</sub> (72 h) for Scenedesmus quadricauda is 46.5 a.i.mg/L.

Effects on bees: Contact acute (48 h) LD<sub>50</sub> is >345 a.i.µg/bee, oral acute (48 h) LD<sub>50</sub> is >600 a.i.µg/bee.

Effects on earthworms: Acute 14 day LC<sub>50</sub> for Eisenia foetida is >1000 a.i.mg/kg.

## 13. Disposal Considerations



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Waste Disposal: Spilled product cannot be re-used and must be disposed of by incineration or disposal in a chemical waste disposal facility.

Container disposal: Non-refillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration; or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

## 14. Transport Information

Not applicable

## 15. Regulatory Information

Not applicable

## 16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.