

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND SUPPLIER

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| Product name | Finale[®] Non-Selective Herbicide |
| Other names | None |
| Product codes | AE F03986600 SL18A5 183873 (5 L), 183881 (20 L) |
| Chemical group | Glycine / phosphinic acid |
| Recommended use | Herbicide for non-selective weed control on rights-of-way and industrial areas |
| Formulation | Soluble concentrate |
| Supplier | Bayer CropScience Pty Ltd ABN 87 000 226 022 |
| Address | 391 - 393 Tooronga Road, East Hawthorn Victoria 3123, Australia |
| Telephone | (03) 9248 6888 |
| Facsimile | (03) 9248 6800 |
| Website | www.bayercropscience.com.au |
| Contact | Technical Manager (03) 9248 6888 |
| Emergency Telephone Number | 1800 033 111 – Orica SH&E Shared Services |

2. HAZARDS IDENTIFICATION
EMERGENCY OVERVIEW
HAZARDOUS SUBSTANCE (see Risk phrases below) – NON DANGEROUS GOOD

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| Hazard designation | Hazardous (National Occupational Health and Safety Commission - NOHSC) |
| Risk phrases | R20/21 – Harmful by inhalation and in contact with skin R36 – Irritating to eyes |
| Safety phrases | See Sections 4, 5, 6, 7, 8, 10, 12, 13 |
| ADG classification | Not a “Dangerous good” for transport by road or rail according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. |
| SUSDP classification | Schedule 5 (Standard for the Uniform Scheduling of Drugs and Poisons) |

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredients | CAS Number | Concentration (g/L) |
|------------------------------------|-----------------|---------------------|
| Glufosinate-ammonium | 77182-82-2 | 200 |
| Propylene glycol monomethyl ether | 107-98-2 | ≈ 110 |
| Other ingredients, including water | (non hazardous) | ≈ 800 |

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| 4. FIRST AID MEASURES |
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| <p>If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. Show this Material Safety Data Sheet to the doctor.</p> |
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| Inhalation | If inhaled, remove to fresh air, keep warm and at rest. Seek medical advice if inhaled in large quantities. |
| Skin contact | Carefully remove contaminated clothing and footwear. Wash affected areas with soap and water. Seek medical aid if at all worried. |
| Eye contact | Rinse eyes immediately with clean water for at least 15 minutes and obtain medical aid. |
| Ingestion | Wash out mouth with water. Do NOT induce vomiting. Seek immediate medical advice, as above. |
| First Aid Facilities | Provide eyewash and safety shower facilities in the workplace. |
| Medical attention | <p>Glufosinate-ammonium is a glutamine synthetase inhibitor and can interfere with neurotransmitter function.</p> <p><i>Symptoms</i></p> <p><i>Local</i> – irritation of eyes, skin, respiratory tract</p> <p><i>Systemic</i> - Shivering, cramps, gastrointestinal complaints, hyperthermia, dyspnoea, bradycardia/tachycardia, convulsions, respiratory depression, amnesia, drowsiness and/or loss of consciousness. These symptoms may be delayed from a few hours to up to 48 hours after exposure. Therefore, regardless of the amount ingested, the patient must be admitted to hospital for at least 36 hours and treated immediately as outlined below.</p> <p><i>Treatment</i></p> <p>Emergency measures: Symptomatic treatment and administration of antidotes, decontamination.</p> <p>If ingested, endotracheal intubation and gastric lavage should be performed as soon as possible, followed by administration of charcoal and sodium sulphate solution.</p> <p>Anticonvulsant therapy: Phenobarbital-sodium, 1 mg/kg intramuscularly or subcutaneously until maximum 5 mg/kg daily; when necessary, 10 mg diazepam slowly intravenously. Repeat as necessary until fully sedated.</p> <p>Elimination by dialysis (forced alkaline diuresis) and/or haemo-perfusion. It is essential that this be done soon after ingestion to be effective.</p> <p>ECG (EKG) - control (electrocardiogram)</p> <p>EEG – control (electroencephalogram)</p> <p>Apply artificial respiration as necessary. If necessary give oxygen.</p> <p>Monitor respiratory, cardiac, central nervous system, electrolyte balance (especially for hypokalemia) and signs of increased intracranial pressure.</p> <p>If a large amount has been ingested, keep under medical supervision for at least 48 hours.</p> <p>Contraindication: Atropine, as glufosinate-ammonium does not inhibit cholinesterase.</p> <p>Recovery is normally spontaneous, usually within 48 hours.</p> |

5. FIRE FIGHTING MEASURES

Extinguishing media Water fog, fine water spray, foam, dry chemical, carbon dioxide.

Hazards from combustion products In a fire, irritant and toxic fumes containing oxides of carbon and nitrogen, hydrogen chloride, sulphur dioxide and other toxic substances may be generated.

5. FIRE FIGHTING MEASURES - continued

Precautions for fire fighters Fire fighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Keep unnecessary people away. If it can be done safely, remove intact containers from the fire. Otherwise, use water spray to cool them. Bund area with sand or earth to prevent contamination of drains or waterways. Dispose of fire control water or other extinguishing agent and spillage safely later.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with the spilled material or contaminated surfaces. Extinguish or remove any sources of ignition. When dealing with spills do not eat, drink or smoke and wear protective clothing and equipment as described in Section 8 – PERSONAL PROTECTION. Keep people and animals away. Prevent spilled material from entering drains or watercourses. Contain spill and absorb with earth, sand, clay, or other absorbent material. Collect and store in properly labelled, sealed drums for safe disposal. Decontaminate the area and equipment with bleach or hydrated lime. Deal with all spillages immediately. If contamination of drains, streams, watercourses, etc. is unavoidable, warn the local water authority.

7. HANDLING AND STORAGE

Handling Keep out of reach of children. Harmful if absorbed by skin contact or if swallowed. Will irritate the eyes and skin. Avoid contact with eyes and skin. Avoid breathing vapour or spray. If product in eyes, wash it out immediately with water. If product on skin, immediately wash area with soap and water. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

Storage Store in the closed, original container in a cool, dry, well-ventilated area. Do not store for prolonged periods in direct sunlight. Keep away from all ignition sources. Keep the container tightly closed, and protect from moisture. Do not store in steel or aluminium containers. The product should be stored between 5° C and 30° C.

Flammability Not flammable under conditions of use. Not classified as a combustible liquid, as the boiling point (96° C) is less than the fire point (> 96° C). The product does not sustain combustion.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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| Exposure standards | <p>NOHSC Exposure Standards: Propylene glycol monomethyl ether TLV-TWA 100 ppm, 369 mg/m³ TLV-STEL 150 ppm, 553 mg/m³</p> <p>Bayer CropScience recommends an exposure standard of 0.6 mg/m³ for glufosinate-ammonium, with a skin notation.</p> <p><i>Exposure standard – Time Weighted Average (TWA)</i> means the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.</p> <p><i>Exposure standard – Short term exposure limit (STEL)</i> means a 15 minute TWA exposure which should not be exceeded at any time during the working day.</p> <p><i>Skin notation</i> – Absorption through the skin may be a significant source of exposure.</p> |
| Engineering controls | <p>Control process conditions to avoid contact. Use only in well-ventilated areas. If necessary, use local exhaust ventilation to keep airborne concentration below the exposure limits.</p> |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION - continued

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| Personal Protective Equipment | <ul style="list-style-type: none"> • Wear face shield or goggles • Wear cotton overalls buttoned to the neck and wrist (or equivalent clothing) and a washable hat. • Wear elbow-length PVC or nitrile gloves. • If working in a poorly ventilated area or if occupational exposure levels are likely to be exceeded, wear a respirator suitable for organic vapours - AS/NZS 1715/1716 approved. • After each day's use, wash gloves, goggles or face shield, respirator if worn, and contaminated clothing. |
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9. PHYSICAL AND CHEMICAL PROPERTIES

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| Appearance: | Blue to bluish-green liquid |
| Odour: | Slightly pungent odour |
| pH: | 4.6 to 6.6 (1% aqueous solution) |
| Vapour pressure: | Low |
| Vapour density: | No data |
| Boiling point: | 96° C |
| Freezing/melting point: | Not available |
| Solubility: | Soluble in water |
| Specific Gravity: | 1.11 at 20° C |
| Flash Point: | 65° C (Pensky Martens Closed Cup) |
| Flammability (explosive) limits: | No data |
| Fire Point: | > 96° C |
| Auto-ignition | |

temperature: 475° C (DIN 51794)
Partition coefficient (octanol/water): *Glufosinate-ammonium*: Log P_{ow} = < 0.1 (pH 7, 22° C)

10. STABILITY AND REACTIVITY

Chemical stability Stable under normal conditions of use.

Hazardous polymerisation Will not polymerise.

Conditions to avoid Avoid sources of ignition and extreme heat.

Incompatible materials Avoid contact with strong oxidising agents, acids or bases. Ammonia may be evolved in the presence of alkalis.

Hazardous decomposition products Ammonia. In a fire, oxides of carbon, nitrogen, phosphorus and sulphur may be emitted.

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

Inhalation Harmful if inhaled.

Skin contact Harmful if absorbed by skin contact. Will irritate the skin.

Eye contact Will irritate the eyes.

Ingestion Harmful if swallowed. Symptoms of poisoning may include: shivering, cramps, stomach complaints, overheating, breathing difficulty, heart problems, convulsions, respiratory depression, loss of memory, drowsiness and/or loss of consciousness. These symptoms may be delayed from a few hours up to 48 hours after ingestion.

ANIMAL TOXICITY DATA – PRODUCT

Acute:

Oral toxicity LD₅₀ rat: 2030 mg/kg (*product*)

Dermal toxicity LD₅₀ rat: 1390 mg/kg (*product*)

Inhalation toxicity LC_{50 rat}: 3.73 mg/L (4 hr) (*product*)

Skin irritation Slightly irritating (rabbit) (*product*)

Eye irritation Slightly to moderately irritating (rabbit) (*product*)

Sensitisation Non-sensitising (guinea pig) (*product*)

Chronic:

In animal studies glufosinate-ammonium showed no reproductive, teratogenic, carcinogenic, mutagenic or neurotoxic effects.

12. ECOLOGICAL INFORMATION

Glufosinate-ammonium is practically non-toxic to birds, fish, honeybees, earthworms and beneficial insects. It is practically non-toxic to *Daphnia*, but moderately toxic to sensitive aquatic species. It is expected to be slightly to moderately toxic to wild animals. DO NOT contaminate streams, rivers or waterways with Finale or the used containers.

EcotoxicityGlufosinate-ammonium:

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| <i>Fish toxicity:</i> | LC ₅₀ (96 h) rainbow trout 710 mg/L LC ₅₀ (96 h) carp, bluegill sunfish, golden orfe > 1000 mg/L |
| <i>Bird toxicity:</i> | Eight day dietary LC ₅₀ Japanese quail > 5000 mg/kg |
| <i>Daphnia toxicity:</i> | <i>Daphnia magna</i> EC ₅₀ (48 h) 560 – 1000 mg/L |
| <i>Algal toxicity:</i> | LD ₅₀ for <i>Scenedesmus subspicatus</i> ≥ 1000 mg/L LD ₅₀ for <i>Scenedesmus capricornutum</i> 37 mg/L |

11. ECOLOGICAL INFORMATION – continued**Environmental fate, persistence and degradability***Aquatic, air or soil environmental hazards:*

Glufosinate-ammonium is very soluble in water and is hydrolytically and photolytically stable. It is rapidly degraded in surface levels of soils and in water. This product is considered to be readily biodegradable. The potential for groundwater contamination with glufosinate-ammonium is minimal. Do not allow product to enter wastewater, rivers or creeks. Glufosinate-ammonium does not accumulate in the fatty tissues of fish or other animals.

13. DISPOSAL CONSIDERATIONS

Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. Do not dispose of undiluted chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt. Dispose of waste product through a reputable waste contractor.

14. TRANSPORT INFORMATION

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| UN number | Not applicable |
| Proper shipping name | Not applicable |
| Class and Subsidiary Risk | Not applicable |
| Packing Group | Not applicable |
| EPG | Not applicable |
| Hazchem code | Not applicable |
| Marine Pollutant | No |

15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Act 1988

National Registration Authority approval number: 48579

16. OTHER INFORMATION

Trademark information Finale[®] is a Registered Trademark of Bayer.

Preparation information Replaces August 1, 2002 MSDS.
Reasons for revision: Updated NOHSC review, medical advice, 16 heading format

This MSDS summarises 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.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

END OF MSDS