

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

Effective Date: 6 March 2006
Product Code: 104788

ESTERON* LV Herbicide

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: ESTERON* LV Herbicide

PURPOSE: For the control of weeds in crops, pastures and non-agricultural areas

COMPANY IDENTIFICATION:

Dow AgroSciences Australia Ltd.
ABN 24 003 771 659
Level 5, 20 Rodborough Road,
Frenchs Forest NSW 2086

Customer Service Toll Free Number:

1800 700 096

(Mon-Fri, 8am–5pm EST)

Emergency Telephone Number:

1800 033 882

(24 hours) (EMERGENCIES ONLY)

Transport Emergency Only Dial 000

2. HAZARD IDENTIFICATION:

EMERGENCY OVERVIEW

Classified as hazardous according to the criteria of NOHSC)

Not Classified as Dangerous Goods for Land Transport

Potential Health Effects: Poisonous if swallowed.

RISK PHRASES:

R22: Harmful if swallowed.

R36/38: Irritating to eyes and skin.

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY PHRASES:

S2: Keep out of reach of children

S7/9: Keep container tightly closed and in a well-ventilated place.

S20/21: When using do not eat, drink or smoke.

S24/25: Avoid skin and eye contact.

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

S26: In case of contact with eyes rinse immediately with plenty of water and seek medical advice.

S27/28: After contact with skin take off immediately all contaminated clothing, and wash immediately with soap and water.

S29: Do not empty into drains.

S61: Avoid release to the environment. Refer to special instructions below in sections 6,7 and 13.

3. COMPOSITION/INFORMATION ON INGREDIENTS:

Ingredient	CAS #	Content
2,4-D Ethylhexyl Ester	001928-43-4	89.8% w/w
Balance not contributing to hazard		10.2% w/w

4. FIRST AID:

Consult the Poisons Information Centre (Australia 131126) or a doctor in every case of suspected chemical poisoning. Never give fluids or induce vomiting if a patient is unconscious or convulsing regardless of cause of injury. If breathing difficulties occur seek medical attention immediately.

EYES: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Move person to fresh air if effects occur. Consult a physician.

* Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

Effective Date: 6 March 2006
Product Code: 104788

ESTERON* LV Herbicide

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: >103°C

FLAMMABLE LIMITS

LFL: Not applicable

UFL: Not applicable

EXTINGUISHING MEDIA: Water fog, foam, alcohol foam, CO₂, dry chemical.

FIRE & EXPLOSION HAZARDS: Noxious fumes under fire conditions. Contain water from fire fighting to prevent entry to surface and ground water.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure self-contained breathing apparatus and full-protective clothing.

HAZCHEM: 2X

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: DO NOT touch or walk through spilled material. Wear a face shield or goggles, overalls buttoned to neck and wrist, chemical resistant gloves and boots. Stop leak when safe to do so. Dike area and prevent entry into waterways, and drains. **Small spills/leaks:** Absorb with material such as sand, soil or sawdust. Collect spilled product and place in sealable container for disposal. Spill residues may be cleaned using water and detergent. Contain and absorb wash water for disposal. Absorb and collect washings and place in the same sealable container for disposal. Dike the area of large spills and report them to Dow AgroSciences at 1800-033-882. Do not use water to clean up.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Keep out of reach of children. Harmful if swallowed. May cause skin irritation. Avoid contact with skin and clothing. After work, remove protective clothing and equipment, wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Clean up spilled material immediately, and wash clothes, equipment and work area after use.

STORAGE: Store in tightly closed original container in a cool, dry well-ventilated area out of direct sunlight when not in use. This product can be stored in an unheated building. Do not store with food, feedstuffs, fertilizers and seeds. See product label for further handling/storage precautions relative to the end use of this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):

2,4-Dichlorophenoxyacetic acid, 2-ethylhexyl ester: None established.

2,4-Dichlorophenoxyacetic acid: NOHSC TWA 10 mg/m³.
ACGIH TLV and OSHA PEL are 10 mg/M³.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an Australian approved air-purifying respirator for organic vapours.

* Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

Effective Date: 6 March 2006
Product Code: 104788

ESTERON* LV Herbicide

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items, such as faceshield, gloves, boots, apron, or full body suit will depend on the operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

EYE PROTECTION: Use safety glasses.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

The following information is based on the active ingredient:

BOILING POINT: 317°C

VAPOUR PRESSURE: 3.6 x 10⁻⁶ mmHg @25°C

VAPOUR DENSITY: Low volatility

SOLUBILITY IN WATER: 0.001g/100g

The following information is based on the material.

APPEARANCE: Amber liquid

ODOUR: Phenolic

pH: 3.4 (1% w/v solution)

RELATIVE DENSITY: 1.35 – 1.45 @ 20 °C

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Stable under normal storage conditions. Not flammable.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)
Acid, base, oxidizing material.

HAZARDOUS DECOMPOSITION PRODUCTS: Noxious fumes under fire conditions - hydrogen chloride and others.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause slight temporary eye irritation. Corneal injury is unlikely.

SKIN: Prolonged contact may cause skin sensitivity and irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. For the active ingredient, the LD₅₀ for skin absorption in rabbits is >4000 mg/kg.

INGESTION: Low toxicity if swallowed. For the active ingredient, the oral LD₅₀ for rats is 896 mg/kg. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury, however, swallowing larger amounts may cause injury.

INHALATION: No adverse effects are anticipated from single exposure to vapor or mist.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: The active ingredient, in animals, effects have been reported on the following organs: gastrointestinal tract, kidney, liver, and muscular system.

CANCER INFORMATION: The active ingredient did not cause cancer in laboratory animals. Various animal cancer tests have shown no reliable positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative.

TERATOLOGY (BIRTH DEFECTS): The active ingredient did not cause birth defects in laboratory animals. Has been toxic to the fetus in laboratory animals at doses non-toxic to the mother.

REPRODUCTIVE EFFECTS: Excessive dietary levels of 2,4-D acid have caused decreased weight and survival in offspring in a rat reproduction study.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): For 2,4-D ethylhexyl ester, in-vitro genetic toxicity studies were negative. For 2,4-D acid, animal genetic toxicity studies were predominantly negative.

* Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

Effective Date: 6 March 2006
Product Code: 104788

ESTERON* LV Herbicide

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT AND PARTITIONING:

Based largely or completely on information for the active ingredient:

Bioconcentration potential is high (BCF >3000 or Log Pow between 5 and 7).

Expected to be relatively immobile in soil (K_{oc} >5000).

DEGRADATION AND PERSISTENCE:

Based largely or completely on information for the active ingredient:

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable, however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Biodegradation may occur under aerobic conditions (in the presence of oxygen).

ECOTOXICOLOGY:

Based largely or completely on information for the active ingredient:

Material is highly toxic to aquatic organisms on an acute basis (LC_{50} or EC_{50} < 1 mg/L in the most sensitive species).

Material is very toxic to plants.

Material is slightly toxic to birds on an acute basis (LD_{50} is between 501 and 2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC_{50} is >5000 ppm).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

ROAD AND RAIL TRANSPORT: Not classified as Dangerous Goods by the Australian Dangerous Goods Code, ADG6.

SEA AND AIR TRANSPORT: Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG) and the International Air Transport Association (IATA) for transport by sea and air.

UN No: 3082

Class: 9

Packing group: III

SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D ESTER)

15. REGULATORY INFORMATION:

APVMA APPROVAL NUMBER: 60216

POISON SCHEDULE: 5

16. OTHER INFORMATION:

Glossary

ACGIH: American Conference of Governmental Industrial Hygienists.

AIHA WEEL: American Industrial Hygiene Association's Workplace Environmental Exposure Level.

BCF: Bioconcentration Factor - a measure for the characterization of the accumulation of a chemical in an organism. It is defined as the concentration of a chemical in an organism (plants, microorganisms, animals) divided by the concentration in a reference compartment (e.g. food, surrounding water).

Dow AgroSciences Industrial Hygiene Guideline: An internal company standard based on an 8 hour TWA.

EC₅₀: median effective concentration. Statistically derived concentration of a substance in an environmental medium expected to produce a certain effect in 50% of test organisms in a given population under a defined set of conditions.

Explosive Limits - The range of concentrations (% by volume in air) of a flammable gas or vapour that can result in an explosion for ignition in a confined space.

K_{oc} - the organic carbon partition coefficient (mL soil water /g organic carbon).

* Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

Effective Date: 6 March 2006
Product Code: 104788

ESTERON* LV Herbicide

LC₅₀ - Lethal Concentration 50%. A concentration of chemical in air or water that will kill 50% of the test organisms.

LD₅₀ - Lethal Dose-50%. The dose of a chemical that will kill 50% of the test animals receiving it.

pH - Measure of how acidic or alkaline a material is using a 1 - 14 scale. pH 1 is strongly acidic and pH 14 strongly alkaline.

NOHSC: National Occupational Health and Safety Commission of Australia now the Office of the Australian Safety and Compensation Council.

OSHA: American Occupational Safety and Health Administration.

PEL: Permissible Exposure Level, a maximum allowable exposure level by law.

Polymerisation - a chemical reaction in which small molecules (monomers) combine to form much larger molecules (polymers). A hazardous polymerisation reaction is one that occurs at a fast rate and releases large amounts of energy.

P_{ow} - The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature. Octanol is an organic solvent that is used as a surrogate for natural organic matter. This parameter is used in many environmental studies to help determine the fate of chemicals in the environment.

STEL: Short-Term Exposure Limit. A term used to indicate the maximum average concentration allowed for a continuous 15 minute exposure period.

TVL: Threshold Limit Value, an exposure limit set by a competent authority

TWA - Time Weighted Average. The average concentration of a chemical in air over the total exposure time - usually an 8 hour work day.

References

AS/NZS 1715-1994 Selection Use and Maintenance of Respiratory Protective Devices.

ASNZS 1716 - 1994 Respiratory protective devices.

Australian Dangerous Goods Code

NOHSC Hazardous Substances Information System.

MSDS of the Components.

FOR FURTHER PRODUCT INFORMATION CALL DOW AGROSCIENCES CUSTOMER SERVICE REPRESENTATIVES TOLL FREE 1800 700 096 DURING BUSINESS HOURS.

This MSDS has been compiled using publicly available information, information provided by suppliers of ingredients used in the product and internal studies on the product and/or its ingredients.

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 BASED ON PUBLICLY AVAILABLE AND INTERNALLY AVAILABLE INFORMATION. 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. THE 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.

© Dow Agrosciences Australia Ltd 2006

* Trademark of Dow AgroSciences LLC