

Agriculture Division of DowDuPont

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Product name: ESTERON™ LV Herbicide

DOW AGROSCIENCES AUSTRALIA LIMITED encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

SECTION 1: IDENTIFICATION: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

Product name: ESTERON™ LV Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES AUSTRALIA LIMITED
LEVEL 9, 67 ALBERT AVENUE
CHATSWOOD NSW 2067
AUSTRALIA

Customer Information Number:

1800-700-096
auscustomerservice@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: +61 2 9474 7350

Local Emergency Contact: 1800-370-754

For advice, contact a doctor (at once) or the Australian Poisons Information Centre: 131 126

Transport Emergency Only Dial 000

SECTION 2: HAZARD(S) IDENTIFICATION

GHS Classification

Acute toxicity - Category 4 - Oral

Serious eye damage/eye irritation – Category 2A

Skin sensitisation - Category 1

Short term (acute) aquatic hazard - Category 1

Long term (chronic) aquatic hazard - Category 1

GHS label elements

Hazard pictograms



Signal word: **WARNING!**

Hazard statements

Harmful if swallowed.

May cause an allergic skin reaction.

Causes serious eye irritation

Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Wash skin thoroughly after handling

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

Wear protective gloves/ eye protection/ face protection.

Response

If skin irritation or rash occurs: Get medical advice/ attention.

If eye irritation persists: Get medical advice/ attention.

Wash contaminated clothing before re-use.

Collect spillage

Disposal

Dispose of contents/ container to an approved waste disposal plant.

Other hazards

No data available

SECTION 3: COMPOSITION AND INFORMATION ON INGREDIENTS, IN ACCORDANCE WITH SCHEDULE 8

Component	CASRN	Concentration
2,4-D 2-ethylhexyl ester	1928-43-4	89.81 %
Ethylhexanol	104-76-7	< 5.0 %
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts	90194-26-6	< 5.0 %
Oxirane, polymer with methyloxirane, mono(nonylphenyl) ether	37251-69-7	< 5.0 %
2,4-dichlorophenoxyacetic acid	94-75-7	< 1.0 %
Balance	Not available	<= 1.79 %

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before re-use. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Eye contact: Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be immediately available.

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. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5: FIREFIGHTING MEASURES

Hazchem Code: ●2X

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Keep up-wind of spill. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

SECTION 7: HANDLING AND STORAGE, INCLUDING HOW THE CHEMICAL MAY BE SAFELY USED

Precautions for safe handling: Keep out of reach of children. Avoid contact with eyes, skin, and clothing. Do not swallow. Avoid prolonged or repeated contact with skin. Avoid breathing vapour or mist. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

Storage stability

24 Month

40 °C

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Ethylhexanol	Dow IHG	TWA	2 ppm SKIN
2,4-dichlorophenoxyacetic acid	ACGIH	TWA Inhalable fraction	10 mg/m ³
	AU OEL	TWA	10 mg/m ³

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection Use chemical resistant gloves classified under standard AS/NZS 2161.10: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to AS/NZS 2161.10) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to AS/NZS 2161.10) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapour cartridge with a particulate pre-filter.

Other Information: Selection and use of personal protective equipment should be in accordance with the recommendations in one or more of the relevant Australian/New Zealand Standards, including:
 AS/NZS 1336: Eye and face protection – Guidelines.
 AS/NZS 1337: Personal eye protection - Eye and face protectors for occupational applications.
 AS/NZS 1715: Selection, use and maintenance of respiratory protective equipment.
 AS/NZS 2161: Occupational protective gloves.
 AS/NZS 2210: Occupational protective footwear.
 AS/NZS 4501: Occupational protective clothing Set

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Colour	Yellow
Odour	Mild
Odour Threshold	No data available
pH	3.4 100% <i>pH Electrode</i> (neat)
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	317 °C
Flash point	closed cup > 103 °C
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No data available
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapour Pressure	No test data available
Relative Vapour Density (air = 1)	1.141
Relative Density (water = 1)	1.132 - 1.152 at 20 °C <i>Unspecified</i>
Water solubility	Emulsifiable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No data available
Kinematic Viscosity	No test data available
Explosive properties	No data available
Oxidizing properties	No data available
Liquid Density	1.132 - 1.152 g/cm ³ at 20 °C <i>Unspecified</i>
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

Incompatible materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity**Acute oral toxicity**

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Single dose oral LD50 has not been determined.

For the active ingredient(s): LD50, Rat, male and female, 896 mg/kg

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

The dermal LD50 has not been determined.

For the active ingredient(s): LD50, Rabbit, male and female, > 2,000 mg/kg. No deaths occurred at this concentration.

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to mist. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Symptoms of excessive exposure may be anaesthetic or narcotic effects; dizziness and drowsiness may be observed.

As product: The LC50 has not been determined.

Skin corrosion/irritation

Brief contact may cause slight skin irritation with local redness.

May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause severe eye irritation.

May cause corneal injury

Sensitization

For the active ingredient(s): Has caused allergic skin reactions when tested in guinea pigs.
For respiratory sensitization: No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s): Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

For the minor component(s): In animals, effects have been reported on the following organs:
Kidney. Liver. Blood. Spleen.

Carcinogenicity

For the active ingredient(s): 2,4-D 2-ethylhexyl ester. Did not cause cancer in laboratory animals.
For the minor component(s): In laboratory animals, evidence of carcinogenic activity was observed.
The observed tumours do not appear to be relevant for men.

Teratogenicity

For the active ingredient(s): Has been toxic to the foetus in laboratory animal tests. There is no evidence that these findings are relevant to humans. Did not cause birth defects in laboratory animals.

For the minor component(s): Has caused birth defects in laboratory animals only at doses toxic to the mother. Has been toxic to the foetus in laboratory animals at doses toxic to the mother. These concentrations exceed relevant human dose levels.

Reproductive toxicity

For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

Based on available information, aspiration hazard could not be determined.

COMPONENTS INFLUENCING TOXICOLOGY:

2,4-D 2-ethylhexyl ester

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to vapour. No adverse effects are anticipated from single exposure to mist. For respiratory irritation and narcotic effects: Relevant data not available.
LC50, Rat, 4 Hour, Aerosol, > 5.39 mg/l

Ethylhexanol

Acute inhalation toxicity

Prolonged excessive exposure may cause adverse effects. May cause respiratory irritation and central nervous system depression. If material is heated or aerosol/mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation and other effects.
LC50, Rat, 4 Hour, dust/mist, 2.17 mg/l

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts**Acute inhalation toxicity**

Prolonged excessive exposure to dust may cause adverse effects. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

The LC50 has not been determined.

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether**Acute inhalation toxicity**

The LC50 has not been determined.

2,4-dichlorophenoxyacetic acid**Acute inhalation toxicity**

Maximum attainable concentration. LC50, Rat, 4 Hour, Dust, > 1.79 mg/l No deaths occurred at this concentration.

Balance**Acute inhalation toxicity**

The LC50 has not been determined.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Ecotoxicity**2,4-D 2-ethylhexyl ester****Acute toxicity to fish**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

LC50, tidewater silverside (*Menidia beryllina*), flow-through test, 96 Hour, > 1.9 mg/l. OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), static test, 48 Hour, > 5 mg/l. OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

As the ester active substance: EbC50, *Skeletonema costatum* (marine diatom), static test, 5 d, Biomass, 0.23 mg/l. OECD Test Guideline 201 or Equivalent

Chronic toxicity to aquatic invertebrates

NOEC, *Daphnia magna* (Water flea), flow-through test, 21 d, weight, 0.015 mg/l

Toxicity to Above Ground Organisms

Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2,000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5,000 ppm).

Oral LD50, *Anas platyrhynchos* (Mallard duck), 663 mg/kg bodyweight.

Dietary LC50, *Anas platyrhynchos* (Mallard duck), 5 d, > 5,620 mg/kg diet.

Oral LD50, *Apis mellifera* (bees), > 100 micrograms/bee

Contact LD50, *Apis mellifera* (bees), > 100 micrograms/bee

Ethylhexanol

Acute toxicity to fish

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 32 - 37 mg/l

LC50, Fathead minnow (Pimephales promelas), 96 Hour, 28.2 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 35.2 mg/l, OECD Test Guideline 202

EC50, Daphnia magna (Water flea), 48 Hour, 39 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 11.5 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50, Bacteria, 16 Hour, 256 - 320 mg/l

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

LC50, Fish, Static, 96 Hour, > 1 - 10 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), Static, 48 Hour, 2.9 mg/l

Acute toxicity to algae/aquatic plants

EC50, Algae, Static, 96 Hour, 29 mg/l

Toxicity to bacteria

EC50, Bacteria, 3 Hour, 550 mg/l

Chronic toxicity to fish

Fish, flow-through, 72 d, 0.23 mg/l

Chronic toxicity to aquatic invertebrates

Daphnia magna (Water flea), flow-through test, 21 d, 1.18 mg/l

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

Acute toxicity to fish

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 86 mg/l

2,4-dichlorophenoxyacetic acid

Acute toxicity to fish

LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 133 - 320 mg/l

LC50, Poecilia reticulata (guppy), static test, 96 Hour, 8.4 - 70.7 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 25 - 262 mg/l
LC50, stonefly Pteronarcys californica, static test, 96 Hour, 1.6 - 15 mg/l

Acute toxicity to algae/aquatic plants

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
EC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, 24.2 mg/l
EC50, Lemna gibba, 14 d, 0.58 mg/l
ErC50, Myriophyllum spicatum, 14 d, 0.373 mg/l
NOEC, Myriophyllum spicatum, 14 d, 0.0305 mg/l

Chronic toxicity to fish

NOEC, Pimephales promelas (fathead minnow), 32 d, growth, 63.4 mg/l
LOEC, Pimephales promelas (fathead minnow), 32 d, growth, 100.9 mg/l
MATC (Maximum Acceptable Toxicant Level), Pimephales promelas (fathead minnow), 32 d, growth, 80 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 46.2 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on a dietary basis (LC50 > 5,000 ppm).
Dietary LC50, Colinus virginianus (Bobwhite quail), > 5,620 mg/kg diet.
Oral LD50, Anas platyrhynchos (Mallard duck), > 500 mg/kg bodyweight.
Oral LD50, Apis mellifera (bees), 94 micrograms/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 48 d, 0.0616 mg/cm²
NOEC, Eisenia fetida (earthworms), 56 d, Other, 50.0 mg/kg

Balance

Acute toxicity to fish

No relevant data found.

Persistence and degradability

2,4-D 2-ethylhexyl ester

Biodegradability: Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%). Biodegradation may occur under aerobic conditions (in the presence of oxygen).

10-day Window: Fail

Biodegradation: 77 %

Exposure time: 29 d

Method: OECD Test Guideline 301B or Equivalent

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	0.84 %
10 d	0.92 %
20 d	1.32 %

Ethylhexanol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Not applicable

Biodegradation: > 95 %

Exposure time: 5 d

Method: OECD Test Guideline 302B or Equivalent

10-day Window: Pass

Biodegradation: 68 %

Exposure time: 17 d

Method: OECD Test Guideline 301B or Equivalent

Theoretical Oxygen Demand: 2.95 mg/mg

Chemical Oxygen Demand: 2.70 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	26 - 70 %
10 d	75 - 81 %
20 d	86 - 87 %

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 9.7 Hour

Method: Estimated.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 100 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

Biodegradability: No relevant information found.

2,4-dichlorophenoxyacetic acid

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Chemical Oxygen Demand: 1.09 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	65 %
10 d	66 %
20 d	85 %

Stability in water (1/2 life): 2 - 4 d, pH 5

Photodegradation

Atmospheric half-life: 6 d

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential**2,4-D 2-ethylhexyl ester**

Bioaccumulation: For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid.

Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water (log Pow): 0.83 at 25 °C Measured

Bioconcentration factor (BCF): 10

Ethylhexanol

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3,000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water (log Pow): 3.1 Measured

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3,000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water (log Pow): 2.89

Bioconcentration factor (BCF): 2 - 1,000

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

Bioaccumulation: No relevant data found.

2,4-dichlorophenoxyacetic acid

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water (log Pow): -0.83 Measured

Bioconcentration factor (BCF): 10 Fish 3 d

Balance

Bioaccumulation: No relevant data found.

Mobility in Soil**2,4-D 2-ethylhexyl ester**

Calculation of meaningful sorption data was not possible due to very rapid degradation in the soil.

For the degradation product: 2,4-Dichlorophenoxyacetic acid. Expected to be relatively immobile in soil (Koc > 5,000).

Ethylhexanol

Potential for mobility in soil is low (Koc between 500 and 2,000).

Partition coefficient (Koc): 800 Estimated.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

No relevant data found.

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

No relevant data found.

2,4-dichlorophenoxyacetic acid

Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient (Koc): 5 - 212 Measured

Balance

No relevant data found.

Results of PBT and vPvB assessment

2,4-D 2-ethylhexyl ester

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ethylhexanol

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

2,4-dichlorophenoxyacetic acid

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Balance

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Other adverse effects

2,4-D 2-ethylhexyl ester

No relevant data found.

Ethylhexanol

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Oxirane, polymer with methyloxirane, mono(nonylphenyl)ether

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

2,4-dichlorophenoxyacetic acid

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Balance

This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods: 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.

This product when disposed of in its unused and uncontaminated state should be treated as a hazardous waste.

SECTION 14: TRANSPORT INFORMATION

ADG

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(2,4-D 2-ethylhexyl ester)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	2,4-D 2-ethylhexyl ester

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D 2-ethylhexyl ester)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	2,4-D 2-ethylhexyl ester
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D 2-ethylhexyl ester)
UN number	UN 3082
Class	9
Packing group	III

Hazchem Code: 2X

Further information:

Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to the Australian Code for the Transport of Dangerous Goods (ADG). This applies when transported by road or rail in packagings that do not incorporate a receptacle exceeding 500 kg(L) or IBCs per ADG Special Provision AU01.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service

representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: REGULATORY INFORMATION

Poison Schedule: S6

APVMA Approval Number: 60216

Australia Inventory of Chemical Substances (AICS)

The product is used in a biocide/pesticide application and is subject to the applicable regulation. It contains a component exempt from inventory listing requirements. Because an intentional component of the product is not on the inventory, the product may only be used in the exempt application.

SECTION 16: ANY OTHER RELEVANT INFORMATION

Revision

Identification Number: 101190575 / A143 / Issue Date: 07.01.2019 / Version: 3.0

DAS Code: GF-1320

Sections amended: 14

Legend

ACGIH	USA. American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV)
AU OEL	Australia. Workplace Exposure Standards for Airborne Contaminants.
Dow IHG	Dow Industrial Hygiene Guideline
SKIN	Absorbed via skin
TWA	Time weighted average

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System.

DOW AGROSCIENCES AUSTRALIA LIMITED urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.