SAFETY DATA SHEET
according to the Hazardous Products Regulations

REXADE™ B Herbicide

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	04/18/2024	800080004861	Date of first issue: 04/18/2024

Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of Canada and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : REXADE™ B Herbicide
Other means of identification : No data available

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE CANADA COMPANY
SUITE 240, 115 QUARRY PARK RD. SE
CALGARY AB, T2C 5G9
CANADA

Customer Information Number : 800-667-3852

E-mail address : solutions@corteva.com

Emergency telephone number : Corteva Canada Solutions: 1-800-667-3852

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Acute toxicity (Oral) : Category 4

Skin sensitisation : Sub-category 1B

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.

Precautionary statements : **Prevention:**
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves.
Response:
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
2,4-D 2-ethylhexyl ester	2,4-D 2-ethylhexyl ester	1928-43-4	87.2
Ethylhexanol	Ethylhexanol	104-76-7	>= 3 - < 10 *
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts	Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts	90194-26-6	>= 3 - < 10 *
2,4-D (ISO)	2,4-D (ISO)	94-75-7	>= 1 - < 3 *
4-chlorophenol	4-chlorophenol	106-48-9	>= 0.1 - < 0.3 *
2,4-dichlorophenol	2,4-dichlorophenol	120-83-2	>= 0.1 - < 0.3 *

* Actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : 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.

In case of 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 reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.
Suitable emergency safety shower facility should be available in work area.

In case of 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 available in work area.

If swallowed : 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 : None known.

Protection of first-aiders : 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.

Notes to physician	:	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. Skin contact may aggravate preexisting dermatitis.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Exposure to combustion products may be a hazard to health. Do not allow run-off from fire fighting to enter drains or water courses.
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: Carbon oxides Hydrogen chloride gas
Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so. Evacuate area. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities. Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained. Prevent from entering into soil, ditches, sewers, underwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up	:	Clean up remaining materials from spill with suitable absorbant.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped,
Recovered material should be stored in a vented container. The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to overpressurization of the container.
Keep in suitable, closed containers for disposal.
Wipe up with absorbent material (e.g. cloth, fleece).
Neutralize with chalk, alkali solution or ammonia.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Do not breathe vapours/dust.
Do not smoke.
Handle in accordance with good industrial hygiene and safety practice.
Avoid exposure - obtain special instructions before use.
Smoking, eating and drinking should be prohibited in the application area.
Do not get on skin or clothing.
Avoid inhalation of vapour or mist.
Do not swallow.
Avoid contact with skin and eyes.
Avoid contact with eyes.
Take care to prevent spills, waste and minimize release to the environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Conditions for safe storage : Store in a closed container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labelled containers.
Store in accordance with the particular national regulations.

Materials to avoid : Do not store near acids.
Strong oxidizing agents

Packaging material : Unsuitable material: None known.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2,4-D 2-ethylhexyl ester	1928-43-4		10 mg/m3	Dow IHG
		TWA	10 mg/m3	CA BC OEL
		STEL	20 mg/m3	CA BC OEL

Ethylhexanol	104-76-7	TWA	2 ppm	Corteva OEL
		TWA	5 ppm	ACGIH
2,4-D (ISO)	94-75-7	TWA	10 mg/m3	CA AB OEL
		TWAEV	10 mg/m3	CA QC OEL
		TWA	10 mg/m3	CA BC OEL
		STEL	20 mg/m3	CA BC OEL
		TWA (Inhalable particulate matter)	10 mg/m3	ACGIH
4-chlorophenol	106-48-9	TWA	0.2 ppm	Dow IHG

Engineering measures : 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.

Personal protective equipment

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.

Hand protection

Remarks : Use gloves chemically resistant to this material. 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. 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.

Eye protection : Use chemical goggles.

Skin and body 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Colour : Yellow

Odour : Characteristic

Odour Threshold : No data available

pH	:	3.91 (22 °C) Concentration: 1 % Method: pH Electrode (1% aqueous suspension)
Melting point/range	:	Not applicable
Freezing point		No data available
Boiling point/boiling range	:	No data available
Flash point	:	136 °C Method: Pensky-Martens Closed Cup ASTM D 93, closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable to liquids
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	No data available
Relative vapour density	:	Not applicable
Density	:	1.14 g/cm3 (20 °C) Method: Digital density meter
Solubility(ies)		
Water solubility	:	emulsifiable
Auto-ignition temperature	:	273 °C Method: Literature Ramped Temperature
Viscosity		
Viscosity, dynamic	:	28.8 mPa,s (20 °C)
Viscosity, kinematic	:	30.2 cSt (20 °C)
Explosive properties	:	No data available
Oxidizing properties	:	No significant increase (>5C) in temperature.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	No decomposition if stored and applied as directed. Stable under normal conditions.
Possibility of hazardous reactions	:	Stable under recommended storage conditions. No hazards to be specially mentioned. None known.
Conditions to avoid	:	None known.

Incompatible materials	:	None.
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 oxides Hydrogen chloride gas

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): 1,750 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 5.16 mg/l Exposure time: 4 h Test atmosphere: dust/mist Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat): > 5,000 mg/kg Symptoms: No deaths occurred at this concentration.

Components:

2,4-D 2-ethylhexyl ester:

Acute oral toxicity	:	LD50 (Rat): 896 mg/kg
Acute inhalation toxicity	:	Remarks: No adverse effects are anticipated from single exposure to vapor. No adverse effects are anticipated from single exposure to mist. For respiratory irritation and narcotic effects: Relevant data not available. LC50 (Rat): > 5.39 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute dermal toxicity

Ethylhexanol:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Target Organs: Central nervous system
Acute inhalation toxicity	:	LC50 (Rat): 2.17 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 3,000 mg/kg Method: OECD Test Guideline 402

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

Acute oral toxicity	:	LD50 (Rat, female): 4,445 mg/kg
Acute dermal toxicity	:	LD50 (Rat, male and female): > 2,000 mg/kg

Assessment: The substance or mixture has no acute dermal toxicity

2,4-D (ISO):

Acute oral toxicity : LD50 (Rat): 639 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 1.79 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Maximum attainable concentration.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 5,000 mg/kg

4-chlorophenol:

Acute oral toxicity : LD50 (Rat): 261 mg/kg

2,4-dichlorophenol:

Acute oral toxicity : LD50 (Rat): 2,000 - 5,000 mg/kg
Remarks: Signs and symptoms of excessive exposure may include:
Incoordination.
Lethargy.
Salivation.
Tremors.

Acute inhalation toxicity : LC50 (Rat): 0.97 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rat): 780 mg/kg
Remarks: Molten or hot 2,4-dichlorophenol is immediately absorbed through skin in amounts which have caused death in humans. Rapid death in humans has been caused by skin exposure without immediate decontamination. Amounts of molten 2,4-dichlorophenol that may cover as little as 1% body surface area (palm of hand-sized) may cause death.
2,4-Dichlorophenol is absorbed more readily through skin when in solution or molten than as a solid.

Skin corrosion/irritation

Product:

Species : Rabbit
Result : Mild skin irritation

Components:

Ethylhexanol:

Species : Rabbit
Result : Skin irritation

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

Result : Skin irritation

2,4-D (ISO):

Species : Rabbit
Result : No skin irritation

4-chlorophenol:

Species : Rabbit
Result : Causes burns.

2,4-dichlorophenol:

Species : Rabbit
Result : Causes burns.

Serious eye damage/eye irritation

Product:
Species : Rabbit
Result : No eye irritation

Components:

Ethylhexanol:
Species : Rabbit
Result : Eye irritation

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

2,4-D (ISO):
Species : Rabbit
Result : Corrosive

4-chlorophenol:
Species : Rabbit
Result : Corrosive

2,4-dichlorophenol:
Species : Rabbit
Result : Corrosive

Respiratory or skin sensitisation

Product:
Species : Mouse
Result : The product is a skin sensitiser, sub-category 1B.

Components:

2,4-D 2-ethylhexyl ester:
Assessment : May cause sensitisation by skin contact.
Remarks : Has caused allergic skin reactions when tested in guinea pigs.
Remarks : For respiratory sensitization:
No relevant data found.

Ethylhexanol:
Test Type : HRIPT (human repeat insult patch test)
Species : human
Assessment : Does not cause skin sensitisation.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Remarks : For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.
Remarks : For respiratory sensitization:
No relevant data found.

2,4-D (ISO):
Species : Guinea pig
Result : May cause sensitisation by skin contact.

Germ cell mutagenicity

Components:

2,4-D 2-ethylhexyl ester:
Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Ethylhexanol:
Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

2,4-D (ISO):

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were predominantly negative., Animal genetic toxicity studies were predominantly negative.

4-chlorophenol:
Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative.

2,4-dichlorophenol:
Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative in some cases and positive in other cases., Animal genetic toxicity studies were negative.

Carcinogenicity
Components:
2,4-D 2-ethylhexyl ester:
Carcinogenicity - Assessment : Did not cause cancer in laboratory animals.

Ethylhexanol:
Carcinogenicity - Assessment : In laboratory animals, evidence of carcinogenic activity was observed., There is no evidence that these findings are relevant to humans.

2,4-D (ISO):
Carcinogenicity - Assessment : There is no evidence of carcinogenicity in laboratory animal toxicity studies. While some epidemiological studies report a positive association between 2,4-D exposure and cancer, a weight of evidence analysis of the epidemiology data across studies reveals no indication that 2,4-D causes cancer in humans.

2,4-dichlorophenol:
Carcinogenicity - Assessment : 2,4,6-Trichlorophenol may be present as an impurity at 0.1% in current samples. This material may also have been present when 2 inconclusive results., Did not cause cancer in laboratory animals.

Reproductive toxicity
Components:
2,4-D 2-ethylhexyl ester:
Reproductive toxicity - Assessment : Has been toxic to the fetus in laboratory animal tests., There is no evidence that these findings are relevant to humans., Did not cause birth defects in laboratory animals.

Ethylhexanol:
Reproductive toxicity - Assessment : Has caused birth defects in laboratory animals only at doses toxic to the mother., Has been toxic to the fetus in laboratory animals at doses toxic to the mother., These concentrations exceed relevant human dose levels.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction.
Did not cause birth defects or any other fetal effects in laboratory animals

2,4-D (ISO):
Reproductive toxicity - Assessment : In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.
Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

2,4-dichlorophenol:
Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction.
Did not cause birth defects or any other fetal effects in laboratory animals.

STOT - single exposure
Product:
Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Components:
Ethylhexanol:
Exposure routes : Inhalation
Target Organs : Respiratory Tract
Assessment : May cause respiratory irritation.
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.
2,4-D (ISO):
Exposure routes : Inhalation
Assessment : May cause respiratory irritation.
4-chlorophenol:
Assessment : Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.
2,4-dichlorophenol:
Assessment : Material is corrosive. Material is not classified as a respiratory irritant; however, upper respiratory tract irritation or corrosivity may be expected.

Repeated dose toxicity
Components:
2,4-D 2-ethylhexyl ester:
Remarks : Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.
Ethylhexanol:
Remarks : In animals, effects have been reported on the following organs:
Blood.
Kidney.
Liver.
Spleen.
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.
2,4-D (ISO):
Remarks : In animals, effects have been reported on the following organs:
Liver.
Kidney.
Gastrointestinal tract.
Muscles.
Observations in animals include:
Gastrointestinal irritation.
Vomiting.
4-chlorophenol:
Remarks : In humans, symptoms may include:
Coma.
Increased respiratory rate.
Restlessness.
Tremors.
2,4-dichlorophenol:
Remarks : In animals, effects have been reported on the following organs:

Blood-forming organs (Bone marrow & Spleen).
Kidney.
Liver.

Aspiration toxicity
Product:
Based on physical properties, not likely to be an aspiration hazard.
Components:
2,4-D 2-ethylhexyl ester:
Based on available information, aspiration hazard could not be determined.
Ethylhexanol:
May be harmful if swallowed and enters airways.
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Based on available information, aspiration hazard could not be determined.
2,4-D (ISO):
Based on physical properties, not likely to be an aspiration hazard.
4-chlorophenol:
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
2,4-dichlorophenol:
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
Components:
2,4-D 2-ethylhexyl ester:

Toxicity to fish	:	Remarks: 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)): > 1.9 mg/l Exposure time: 96 h Test Type: flow-through test Method: OECD Test Guideline 203 or Equivalent
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 5 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 or Equivalent
Toxicity to algae/aquatic plants	:	EbC50 (Skeletonema costatum (marine diatom)): 0.23 mg/l End point: Biomass Exposure time: 5 d Test Type: static test Method: OECD Test Guideline 201 or Equivalent
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.015 mg/l End point: weight Exposure time: 21 d Test Type: flow-through test
Toxicity to terrestrial organ-isms	:	Remarks: Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm). oral LD50 (Anas platyrhynchos (Mallard duck)): 663 mg/kg bodyweight.

dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5620 mg/kg diet.
Exposure time: 5 d

oral LD50 (Apis mellifera (bees)): > 100 micrograms/bee

contact LD50 (Apis mellifera (bees)): > 100 micrograms/bee

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Ethylhexanol:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 32 - 37 mg/l
Exposure time: 96 h

LC50 (Fathead minnow (Pimephales promelas)): 28.2 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 35.2 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

EC50 (Daphnia magna (Water flea)): 39 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 11.5 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Method: OECD Test Guideline 201 or Equivalent

Toxicity to microorganisms : EC50 (Bacteria): 256 - 320 mg/l
Exposure time: 16 h

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

Toxicity to fish : Remarks: 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).

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

LC50 (Fish): > 1 - 10 mg/l
Exposure time: 96 h
Test Type: Static

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.9 mg/l
Exposure time: 48 h
Test Type: Static

Toxicity to algae/aquatic plants : EC50 (Algae): 29 mg/l
Exposure time: 96 h

Test Type: Static

Toxicity to fish (Chronic toxicity) : (Fish): 0.23 mg/l
Exposure time: 72 d
Test Type: flow-through

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : (Daphnia magna (Water flea)): 1.18 mg/l
Exposure time: 21 d
Test Type: flow-through test

Toxicity to microorganisms : EC50 (Bacteria): 550 mg/l
Exposure time: 3 h

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

2,4-D (ISO):

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 133 - 320 mg/l
Exposure time: 96 h
Test Type: static test

LC50 (Poecilia reticulata (guppy)): 8.4 - 70.7 mg/l
Exposure time: 96 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 25 - 262 mg/l
Exposure time: 48 h
Test Type: static test

LC50 (stonefly Pteronarcys californica): 1.6 - 15 mg/l
Exposure time: 96 h
Test Type: static test

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 24.2 mg/l
Exposure time: 96 h

EC50 (Lemna gibba): 0.58 mg/l
Exposure time: 14 d

ErC50 (Myriophyllum spicatum): 0.373 mg/l
Exposure time: 14 d

NOEC (Myriophyllum spicatum): 0.0305 mg/l
Exposure time: 14 d

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 63.4 mg/l
End point: growth
Exposure time: 32 d

LOEC (Pimephales promelas (fathead minnow)): 100.9 mg/l
End point: growth
Exposure time: 32 d

MATC (Maximum Acceptable Toxicant Level) (Pimephales promelas (fathead minnow)): 80 mg/l

End point: growth
Exposure time: 32 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 46.2 mg/l
End point: number of offspring
Exposure time: 21 d

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): 0.0616 mg/cm2
Exposure time: 48 d

NOEC (Eisenia fetida (earthworms)): 50.0 mg/kg
Exposure time: 56 d
End point: Other
Method: Other guidelines
GLP: yes

Toxicity to terrestrial organisms : dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5620 mg/kg diet.

oral LD50 (Anas platyrhynchos (Mallard duck)): > 500 mg/kg bodyweight.

oral LD50 (Apis mellifera (bees)): 94 micrograms/bee

4-chlorophenol:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 3.8 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 2.5 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent

LC50 (Ceriodaphnia dubia (water flea)): 9 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : EbC50 (Pseudokirchneriella subcapitata (green algae)): 7.4 mg/l
End point: Biomass
Exposure time: 96 h
Method: OECD Test Guideline 201 or Equivalent

EbC50 (Skeletonema costatum (marine diatom)): 12 - 14 mg/l
End point: Biomass
Exposure time: 96 h
Method: OECD Test Guideline 201 or Equivalent

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.63 mg/l
End point: number of offspring
Exposure time: 21 d

LOEC (Daphnia magna (Water flea)): 1.25 mg/l
End point: number of offspring
Exposure time: 21 d

MATC (Maximum Acceptable Toxicant Level) (Daphnia magna (Water flea)): 0.82 mg/l
End point: number of offspring
Exposure time: 21 d

Toxicity to microorganisms : IC50 (activated sludge): 150 - 178 mg/l
Exposure time: 3 h

2,4-dichlorophenol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 6.7 - 11.6 mg/l
Exposure time: 96 h
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.50 - 6.0 mg/l
Exposure time: 24 h

Toxicity to algae/aquatic plants : LC50 (alga Scenedesmus sp.): 11.5 mg/l
End point: Biomass
Exposure time: 48 h
Method: OECD Test Guideline 201 or Equivalent

Toxicity to microorganisms : EC50 (activated sludge): 52.5 mg/l

EC50 (Bacteria): 55 - 75 mg/l

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): 0.0025 mg/cm2
Exposure time: 2 d
End point: survival

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Persistence and degradability

Components:

2,4-D 2-ethylhexyl ester:

Biodegradability : Remarks: 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).

Result: Not biodegradable
Biodegradation: 77 %
Exposure time: 29 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Fail

Biochemical Oxygen Demand (BOD) : 0.84 %
Incubation time: 5 d

0.92 %
Incubation time: 10 d

1.32 %
Incubation time: 20 d

Ethylhexanol:

Biodegradability : Result: Readily biodegradable.

Biodegradation: > 95 %
Exposure time: 5 d
Method: OECD Test Guideline 302B or Equivalent
Remarks: 10-day Window: Not applicable

Biodegradation: 68 %
Exposure time: 17 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Pass

Biochemical Oxygen Demand (BOD) : 26 - 70 %
Incubation time: 5 d

75 - 81 %
Incubation time: 10 d

86 - 87 %
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 2.70 kg/kg

ThOD : 2.95 kg/kg

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitiser: OH radicals
Rate constant: 1.32E-11 cm3/s
Method: Estimated.

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

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

Result: Readily biodegradable.
Biodegradation: 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Pass

2,4-D (ISO):

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

Biochemical Oxygen Demand (BOD) : 65 %
Incubation time: 5 d

66 %
Incubation time: 10 d

85 %
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 1.09 kg/kg

Stability in water : Degradation half life (half-life): 2 - 4 d pH: 5

Photodegradation :

4-chlorophenol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 96 %

Exposure time: 8 d
Method: OECD Test Guideline 302B

Result: Readily biodegradable.
Biodegradation: 100 %
Exposure time: 17 d
Method: OECD Test Guideline 302C or Equivalent

Biochemical Oxygen Demand (BOD) : 64 %
Incubation time: 5 d

19 %
Incubation time: 10 d

81.5 %
Incubation time: 20 d

ThOD : 1.62 kg/kg

2,4-dichlorophenol:

Biodegradability : Result: Not biodegradable
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Remarks: 10-day Window: Not applicable

Biochemical Oxygen Demand (BOD) : 76.000 %
Incubation time: 5 d

77.000 %
Incubation time: 10 d

77.000 %
Incubation time: 20 d

ThOD : 1.18 kg/kg

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitiser: OH radicals
Rate constant: 2.98E-12 cm3/s
Method: Estimated.

Bioaccumulative potential
Components:
2,4-D 2-ethylhexyl ester:

Bioaccumulation : Bioconcentration factor (BCF): 10

Partition coefficient: n-octanol/water : log Pow: 0.83 (25 °C)
pH: 7
Method: Measured
Remarks: For similar active ingredient(s).
2,4-Dichlorophenoxyacetic acid.
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Ethylhexanol:

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

Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

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

Bioaccumulation : Bioconcentration factor (BCF): 2 - 1,000

Partition coefficient: n-octanol/water : log Pow: 2.89
Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

2,4-D (ISO):

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 10
Exposure time: 3 d

Partition coefficient: n-octanol/water : log Pow: -0.83
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

4-chlorophenol:

Bioaccumulation : Species: Carassius auratus (goldfish)
Bioconcentration factor (BCF): 10 - 15

Partition coefficient: n-octanol/water : log Pow: 2.39
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

2,4-dichlorophenol:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 34
Method: Measured

Partition coefficient: n-octanol/water : log Pow: 3.06
Method: Measured
Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Mobility in soil

Components:

2,4-D 2-ethylhexyl ester:

Distribution among environmental compartments : Remarks: 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 > 5000).

Ethylhexanol:

Distribution among environmental compartments : Koc: 800
Method: Estimated.
Remarks: Potential for mobility in soil is low (Koc between 500 and 2000).

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

Distribution among environmental compartments : Remarks: No relevant data found.

2,4-D (ISO):

Distribution among environmental compartments : Koc: 5 - 212
Method: Measured
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Stability in soil	:	Test Type: Photolysis Dissipation time: 68 d Method: Estimated. Test Type: aerobic degradation Dissipation time: 1.7 - 4 d Method: Measured Test Type: anaerobic degradation Dissipation time: 66.2 d Method: Measured

2,4-dichlorophenol:

Distribution among environmental compartments	:	Koc: 550 Method: Measured Remarks: Potential for mobility in soil is low (Koc between 500 and 2000).

Other adverse effects

Components:

2,4-D 2-ethylhexyl ester:

Results of PBT and vPvB assessment	:	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).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Ethylhexanol:

Results of PBT and vPvB assessment	:	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).
Ozone-Depletion Potential	:	Remarks: 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:

Results of PBT and vPvB assessment	:	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

2,4-D (ISO):

Results of PBT and vPvB assessment	:	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).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

4-chlorophenol:

Results of PBT and vPvB assessment	:	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).
Ozone-Depletion Potential	:	Regulation: (Update: 12/312010; RT) Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

2,4-dichlorophenol:

Results of PBT and vPvB assessment	:	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	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.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D Ester)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	yes

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (2,4-D Ester)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D Ester)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes(2,4-D Ester)
Remarks	:	Stowage category A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

TDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2,4-D Ester)
Class	:	9
Packing group	:	III
Labels	:	9
ERG Code	:	171
Marine pollutant	:	yes(2,4-D Ester)

Further information
Marine Pollutants assigned UN number 3077 and 3082 in single or combination packaging containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 KG or less for solids may be transported as non-dangerous goods as provided in section 2.10.2.7 of IMDG code, IATA Special provision A197, and ADR/RID special provision 375.

For Canadian Ground transportation TDG Exemption: 1.45.1 Marine Pollutants (Part 3, Documentation, and Part 4, Dangerous Goods Safety Marks, do not apply if they are in transport solely on land by road vehicle or railway vehicle).
Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

The components of this product are reported in the following inventories:

DSL : This product contains components that are not listed on the Canadian DSL nor NDSL.

Pest Control Products Act (PCPA) Registration Number : 32294

Read the PCPA label, authorized under the Pest Control Products Act, prior to using or handling this pest control product.
This chemical is a pest control product registered by Health Canada Pest Management Regulatory Agency and is subject to certain labelling requirements under the Pest Control Products Act (PCPA). There are Canada-specific environmental requirements for handling, use, and disposal of this pest control product that are indicated on the label. These requirements differ from the classification criteria and hazard information required for GHS-consistent safety data sheets. Following is the hazard information required on the pest control products label:
PCPA Label Hazard Communications:
Read the label and booklet before using. Keep out of reach of children.

CAUTION POISON

WARNING SKIN IRRITANT

POTENTIAL SKIN SENSITIZER

This product is toxic to:
Small wild mammals
Birds
Aquatic organisms
Non-target terrestrial plants

SECTION 16. OTHER INFORMATION

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
CA AB OEL	:	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	:	Canada. British Columbia OEL
CA QC OEL	:	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
Corteva OEL	:	Corteva Occupational Exposure Limit
Dow IHG	:	Dow Industrial Hygiene Guideline
ACGIH / TWA	:	8-hour, time-weighted average
CA AB OEL / TWA	:	8-hour Occupational exposure limit
CA BC OEL / TWA	:	8-hour time weighted average
CA BC OEL / STEL	:	short-term exposure limit
CA QC OEL / TWAEV	:	Time-weighted average exposure value
Corteva OEL / TWA	:	8-hr TWA
Dow IHG / TWA	:	Time Weighted Average (TWA):

ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; ASTM - American Society for the Testing of Materials; ECx - Concentration associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; 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; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; 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; NOEC - Non-Observed Effective Concentration; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; (Q)SAR - (Quantitative) Structure Activity Relationship; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SDS - Safety Data Sheet; UN - United Nations.
DSL - Domestic substances List. WHMIS - Workplace Hazardous Materials Information System.

Revision Date	:	04/18/2024
Date format	:	mm/dd/yyyy

Product code: GF-1406

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

CA / 6N