SAFETY DATA SHEET
according to the Hazardous Products Regulations

REZUVANT XL HERBICIDE

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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 : REZUVANT XL 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

Flammable liquids : Category 4

Skin sensitisation : Category 1

Carcinogenicity : Category 2

Reproductive toxicity : Category 2

Aspiration hazard : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H227 Combustible liquid.
H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing mist or vapours.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P331 Do NOT induce vomiting.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 Store in a well-ventilated place.
P405 Store locked up.

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
fluroxypyr-meptyl (ISO)	fluroxypyr-meptyl (ISO)	81406-37-3	15.32
pinoxaden (ISO)	pinoxaden (ISO)	243973-20-8	5.1
Cloquintocet-mexyl	Cloquintocet-mexyl	99607-70-2	1.28
Halauxifen-methyl	Halauxifen-methyl	943831-98-9	0.44
Tri(2-ethylhexyl) phosphate	Tri(2-ethylhexyl) phosphate	78-42-2	>= 30 - < 40 *
2-methylpentane-2,4-diol	2-methylpentane-2,4-diol	107-41-5	>= 10 - < 20 *

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	>= 10 - < 20 *
Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts	Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts	90194-26-6	>= 1 - < 3 *
Ethylhexanol	Ethylhexanol	104-76-7	>= 1 - < 3 *
naphthalene	naphthalene	91-20-3	>= 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 effects occur, consult a physician.

In case of skin contact : Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse.
Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

In case of eye contact : Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.
Suitable emergency eye wash facility should be immediately available.

If swallowed : No emergency medical treatment necessary.

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.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)

Unsuitable extinguishing media : Do not use direct water stream.
High volume water jet

Specific hazards during firefighting : Exposure to combustion products may be a hazard to health.
Vapours may form explosive mixtures with air.
Do not allow run-off from fire fighting to enter drains or water courses.
Flash back possible over considerable distance.

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

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.

Further information : Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.
Do not use a solid water stream as it may scatter and spread fire.
Use a water spray to cool fully closed containers.
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 : Ensure adequate ventilation.
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).
Non-sparking tools should be used.
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Suppress (knock down) gases/vapours/mists with a water spray jet.
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

Local/Total ventilation : Use with local exhaust ventilation.

Advice on safe handling : Avoid formation of aerosol.
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.
Provide sufficient air exchange and/or exhaust in work rooms.
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.
Keep container tightly closed.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
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.
No smoking.
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
Explosives
Gases

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-methylpentane-2,4-diol	107-41-5	STEL (Aerosol)	10 mg/m3	Dow IHG
		TLV-C (Vapour)	25 ppm	Dow IHG

		(c)	25 ppm 121 mg/m3	CA AB OEL
		C	25 ppm 121 mg/m3	CA QC OEL
		TWA (Vapour)	25 ppm	ACGIH
		STEL (Vapour)	50 ppm	ACGIH
		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH
fluroxypyr-meptyl (ISO)	81406-37-3	TWA	10 mg/m3	Dow IHG
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	TWA	100 mg/m3	Corteva OEL
		STEL	300 mg/m3	Corteva OEL
		TWA	200 mg/m3 (total hydrocarbon vapor)	CA AB OEL
		TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
Ethylhexanol	104-76-7	TWA	2 ppm	Corteva OEL
		TWA	5 ppm	ACGIH
naphthalene	91-20-3	TWA	10 ppm	Dow IHG
		STEL	15 ppm	Dow IHG
		TWA	10 ppm 52 mg/m3	CA AB OEL
		STEL	15 ppm 79 mg/m3	CA AB OEL
		TWA	10 ppm	CA BC OEL
		TWAEV	10 ppm	CA QC OEL
		TWA	10 ppm	ACGIH

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 safety glasses (with side shields).
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	:	Solvent
Odour Threshold	:	No data available
pH	:	4.80 (21.1 °C)
Melting point/range	:	Not applicable
Freezing point		No data available
Boiling point/boiling range	:	No data available
Flash point	:	80 °C Method: closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
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	:	No data available
Density	:	0.9785 g/cm3 (20 °C)

Solubility(ies)
Water solubility : No data available

Auto-ignition temperature : No data available

Viscosity
Viscosity, dynamic : 31.7 mPa,s (20 °C)

14.2 mPa,s (40 °C)

Explosive properties : No

Oxidizing properties : No data available

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.
Vapours may form explosive mixture with air.
May form explosive dust-air mixture.
Conditions to avoid : Heat, flames and sparks.
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

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity : LD50 (Rat, female): > 5,000 mg/kg
Method: OECD Test Guideline 423
Symptoms: No deaths occurred at this concentration.

Acute inhalation toxicity : LC50 (Rat, male and female): 8.4 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:

fluroxypyr-meptyl (ISO):

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity	:	LC50 (Rat, male and female): > 1.16 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 Remarks: Maximum attainable concentration.
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

pinoxaden (ISO):

Acute oral toxicity	:	Remarks: 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. LD50 (Rat): 500 mg/kg Method: Expert judgement
Acute inhalation toxicity	:	Remarks: Prolonged excessive exposure to dust may cause adverse effects. LC50 (Rat, male): 4.63 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403
Acute dermal toxicity	:	Remarks: Prolonged skin contact is unlikely to result in absorption of harmful amounts. LD50 (Rat, male and female): > 2,000 mg/kg Method: OECD Test Guideline 402 Symptoms: No deaths occurred at this concentration.

Cloquintocet-mexyl:

Acute oral toxicity	:	LD50 (Rat, female): > 2,000 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 5.42 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg

Halauxifen-methyl:

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

Tri(2-ethylhexyl) phosphate:

Acute oral toxicity	:	LD50 (Rat, male): 9,260 mg/kg
Acute inhalation toxicity	:	Remarks: Brief exposure (minutes) is not likely to cause adverse effects. LC50 (Rat, male and female): > 0.447 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

2-methylpentane-2,4-diol:

Acute oral toxicity	:	LD50 (Rat): 3,600 - 4,700 mg/kg
Acute inhalation toxicity	:	Remarks: Vapor from heated material may cause respiratory irritation. No deaths occurred following exposure to a saturated atmosphere.
Acute dermal toxicity	:	LD50 (Rabbit): 13,200 mg/kg

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Remarks: For similar material(s):
Acute inhalation toxicity	:	LC50 (Rat): > 4.688 mg/l Exposure time: 4 h Test atmosphere: vapour Assessment: The substance or mixture has no acute inhalation toxicity Remarks: For similar material(s): Maximum attainable concentration.
Acute dermal toxicity	:	LD50 (Rabbit): > 3,160 mg/kg Assessment: The substance or mixture has no acute dermal toxicity Remarks: For similar material(s):

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

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

naphthalene:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Lethal Dose (Humans): 5 - 15 grams Method: Estimated. Remarks: Excessive exposure may cause hemolysis, thereby impairing the blood's ability to transport oxygen. Ingestion of naphthalene by humans has caused hemolytic anemia. Toxicity from swallowing may be greater in humans than in animals. In humans, symptoms may include: Confusion. Lethargy. Muscle spasms or twitches. Convulsions. Coma.
Acute inhalation toxicity	:	Remarks: Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Excessive exposure may cause lung injury. Signs and symptoms of excessive exposure may include: Headache. Confusion. Sweating. Nausea and/or vomiting. LC50 (Rat): > 0.41 mg/l Exposure time: 4 h Test atmosphere: vapour Symptoms: The LC50 value is greater than the Maximum Attainable Concentration. Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat): > 2,500 mg/kg Remarks: Human case reports suggest Naphthalene may be absorbed through the skin in toxic amounts, especially in children. LD50 (Rabbit): > 2,500 mg/kg

Skin corrosion/irritation

Product:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Components:

fluroxypyr-meptyl (ISO):

Species	:	Rabbit
Result	:	No skin irritation

pinoxaden (ISO):

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Tri(2-ethylhexyl) phosphate:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	Skin irritation

2-methylpentane-2,4-diol:

Result	:	Skin irritation

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

Result	:	Skin irritation

Ethylhexanol:

Species	:	Rabbit
Result	:	Skin irritation

Serious eye damage/eye irritation

Product:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405

Components:

pinoxaden (ISO):

Species	:	Rabbit
Result	:	Eye irritation
Method	:	OECD Test Guideline 405

2-methylpentane-2,4-diol:

Result	:	Eye irritation

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

Result	:	Corrosive

Ethylhexanol:

Species	:	Rabbit
Result	:	Eye irritation

Respiratory or skin sensitisation

Product:

Test Type	:	Local lymph node assay (LLNA)
Species	:	Mouse
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 429

Components:

fluroxypyr-meptyl (ISO):

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.

pinoxaden (ISO):

Test Type	:	Local lymph node assay (LLNA)
Species	:	Mouse
Assessment	:	The product is a skin sensitiser, sub-category 1A.
Method	:	OECD Test Guideline 429
Remarks	:	For skin sensitization: Did not cause allergic skin reactions when tested in guinea pigs. Has demonstrated the potential for contact allergy in mice.
Remarks	:	For respiratory sensitization: No relevant data found.

Cloquintocet-mexyl:

Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.

Halauxifen-methyl:

Remarks	:	Did not demonstrate the potential for contact allergy in mice.
Remarks	:	For respiratory sensitization: No relevant data found.

Tri(2-ethylhexyl) phosphate:

Remarks	:	Did not cause allergic skin reactions when tested in guinea pigs.
Remarks	:	For respiratory sensitization: No relevant data found.

2-methylpentane-2,4-diol:

Remarks	:	Did not cause allergic skin reactions when tested in guinea pigs. Skin contact may cause an allergic skin reaction in a small proportion of individuals.
Remarks	:	For respiratory sensitization: No relevant data found.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Remarks	:	For similar material(s): Did not cause allergic skin reactions when tested in guinea pigs.
Remarks	:	For respiratory sensitization: No relevant data found.

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.

Ethylhexanol:

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

naphthalene:

Assessment	:	Does not cause skin sensitisation.
Remarks	:	Skin contact may cause an allergic skin reaction in a small proportion of individuals. Did not cause allergic skin reactions when tested in guinea pigs.
Remarks	:	For respiratory sensitization: No relevant data found.

Germ cell mutagenicity

Components:

fluroxypyr-meptyl (ISO):

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

pinoxaden (ISO):

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

Cloquintocet-mexyl:

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

Halauxifen-methyl:

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

2-methylpentane-2,4-diol:

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Germ cell mutagenicity - Assessment	:	For similar material(s):, 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.

Ethylhexanol:

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

naphthalene:

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

Carcinogenicity

Components:

fluroxypyr-meptyl (ISO):

Carcinogenicity - Assessment	:	For similar active ingredient(s)., Fluroxypyr., Did not cause cancer in laboratory animals.

pinoxaden (ISO):

Carcinogenicity - Assessment	:	Did not cause cancer in laboratory animals.

Cloquintocet-mexyl:

Carcinogenicity - Assessment	:	Did not cause cancer in laboratory animals.

Halauxifen-methyl:

Carcinogenicity - Assessment	:	For similar active ingredient(s)., Halauxifen., 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.

naphthalene:

Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies Has caused cancer in some laboratory animals., In humans, there is limited evidence of cancer in workers involved in naphthalene production. Limited oral studies in rats were negative.

Reproductive toxicity

Components:

fluroxypyr-meptyl (ISO):

Reproductive toxicity - Assessment	:	In animal studies, did not interfere with reproduction. Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

pinoxaden (ISO):

Reproductive toxicity - Assessment	:	Suspected human reproductive toxicant In animal studies, has been shown to interfere with reproduction. Did not cause birth defects in laboratory animals.

Cloquintocet-mexyl:

Reproductive toxicity - Assessment	:	Did not cause birth defects or any other fetal effects in laboratory animals.

Halauxifen-methyl:

Reproductive toxicity - Assessment	:	For similar active ingredient(s)., Halauxifen., In animal studies, did not interfere with reproduction. Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

Tri(2-ethylhexyl) phosphate:

Reproductive toxicity - Assessment	:	Did not cause birth defects or any other fetal effects in laboratory animals.

2-methylpentane-2,4-diol:

Reproductive toxicity - Assessment	:	In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals., In animal studies, did not interfere with fertility. Did not cause birth defects in laboratory animals.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Reproductive toxicity - Assessment	:	In animal studies, did not interfere with reproduction. For similar material(s):, Did not cause birth defects or any other fetal effects in laboratory animals.

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.

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.

naphthalene:

Reproductive toxicity - Assessment	:	Available data are inadequate to determine effects on reproduction. Did not cause birth defects in laboratory animals.

STOT - single exposure

Product:

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

Components:

pinoxaden (ISO):

Exposure routes	:	Inhalation
Assessment	:	May cause respiratory irritation.

Cloquintocet-mexyl:

Assessment	:	Available data are inadequate to determine single exposure specific target organ toxicity.

Halauxifen-methyl:

Assessment	:	Available data are inadequate to determine single exposure specific target organ toxicity.

Tri(2-ethylhexyl) phosphate:

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

2-methylpentane-2,4-diol:

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Exposure routes : Inhalation
Assessment : May cause drowsiness or dizziness.

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

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

Ethylhexanol:

Exposure routes : Inhalation
Target Organs : Respiratory Tract
Assessment : May cause respiratory irritation.

naphthalene:

Assessment : Available data are inadequate to determine single exposure specific target organ toxicity.

STOT - repeated exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-RE toxicant.

Repeated dose toxicity

Components:

fluroxypyr-meptyl (ISO):

Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

pinoxaden (ISO):

Remarks : In animals, effects have been reported on the following organs:
Kidney
Liver

Cloquintocet-mexyl:

Remarks : In animals, effects have been reported on the following organs:
Liver.
Kidney.
Thymus.
Thyroid.
Bladder.
Bone marrow.

Halauxifen-methyl:

Remarks : In animals, effects have been reported on the following organs:
Kidney.
Liver.
Thyroid.

Tri(2-ethylhexyl) phosphate:

Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

2-methylpentane-2,4-diol:

Remarks : In animals, effects have been reported on the following organs:
Kidney.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

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

Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Ethylhexanol:

Remarks : In animals, effects have been reported on the following organs:
Blood.
Kidney.
Liver.
Spleen.

naphthalene:

Remarks : Observations in animals include:
Respiratory effects.
Excessive exposure may cause hemolysis, thereby impairing the blood's ability to transport oxygen.
Cataracts and other eye effects have been reported in humans repeatedly exposed to naphthalene vapor or dust.
Ingestion of naphthalene by humans has caused hemolytic anemia.

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

Components:

fluroxypyr-meptyl (ISO):

Based on physical properties, not likely to be an aspiration hazard.

pinoxaden (ISO):

Based on physical properties, not likely to be an aspiration hazard.

Cloquintocet-mexyl:

Based on physical properties, not likely to be an aspiration hazard.

Halauxifen-methyl:

Based on physical properties, not likely to be an aspiration hazard.

Tri(2-ethylhexyl) phosphate:

Based on physical properties, not likely to be an aspiration hazard.

2-methylpentane-2,4-diol:
Based on available information, aspiration hazard could not be determined.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:
May be fatal if swallowed and enters airways.

Benzenesulfonic Acid, 4-C10-14-Alkyl Derivs., Calcium Salts:
Based on available information, aspiration hazard could not be determined.

Ethylhexanol:
May be harmful if swallowed and enters airways.

naphthalene:
Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

fluroxypyr-meptyl (ISO):

Toxicity to fish	:	Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species). LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.225 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203 or Equivalent
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 0.183 mg/l Exposure time: 48 h Test Type: semi-static test Method: OECD Test Guideline 202 or Equivalent
Toxicity to algae/aquatic plants	:	ErC50 (diatom Navicula sp.): 0.24 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent EbC50 (alga Scenedesmus sp.): > 0.47 mg/l Exposure time: 72 h ErC50 (Selenastrum capricornutum (green algae)): > 1.410 mg/l Exposure time: 96 h ErC50 (Myriophyllum spicatum): 0.075 mg/l Exposure time: 14 d NOEC (Myriophyllum spicatum): 0.031 mg/l Exposure time: 14 d
Toxicity to fish (Chronic toxicity)	:	NOEC (Rainbow trout (Oncorhynchus mykiss)): 0.32 mg/l
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg

Toxicity to terrestrial organisms	:	Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm). oral LD50 (Colinus virginianus (Bobwhite quail)): > 2000 mg/kg bodyweight. Exposure time: 5 d dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5000 mg/kg diet. oral LD50 (Apis mellifera (bees)): > 100 micrograms/bee Exposure time: 48 h contact LD50 (Apis mellifera (bees)): > 100 micrograms/bee Exposure time: 48 h

pinoxaden (ISO):

Toxicity to fish	:	Remarks: 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)): 10.3 mg/l Exposure time: 96 h Test Type: flow-through Method: OECD Test Guideline 203 LC50 (Pimephales promelas (fathead minnow)): 20 mg/l Exposure time: 96 h Test Type: flow-through Method: OECD Test Guideline 203 LC50 (Cyprinodon variegatus (sheepshead minnow)): > 16 mg/l Exposure time: 96 h Test Type: flow-through Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 52 mg/l Exposure time: 48 h Test Type: flow-through test Method: OECD Test Guideline 202 LC50 (Americamysis bahia (mysid shrimp)): 8.3 mg/l Exposure time: 96 h Test Type: flow-through test Method: US EPA Test Guideline OPPTS 850.1035 EC50 (Oyster, Crassostrea virginica): 0.40 mg/l Exposure time: 96 h Test Type: flow-through test Method: US EPA Test Guideline OPPTS 850.1035 LC50 (Oyster, Crassostrea virginica): > 0.88 mg/l Exposure time: 96 h Test Type: flow-through test Method: US EPA Test Guideline OPPTS 850.1035

Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 41 mg/l Exposure time: 48 h Method: OECD Test Guideline 201 ErC50 (Skeletonema costatum (Diatom)): 0.80 mg/l Exposure time: 72 h Test Type: Static Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 1 mg/l Exposure time: 32 d Test Type: flow-through Method: US EPA Test Guideline OPPTS 850.1400
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna): 6.25 mg/l Exposure time: 21 d Test Type: semi-static test Method: OECD Test Guideline 211

Ecotoxicology Assessment

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

Cloquintocet-mexyl:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.97 mg/l Exposure time: 96 h Test Type: flow-through test Method: Method Not Specified. Remarks: As the ester active substance.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 0.82 mg/l Exposure time: 48 h Test Type: flow-through test Method: Method Not Specified.
Toxicity to algae/aquatic plants	:	EbC50 (alga Scenedesmus sp.): 0.63 mg/l End point: Biomass Exposure time: 96 h Method: Method Not Specified. EbC50 (Lemna minor (duckweed)): > 0.42 mg/l End point: Biomass Exposure time: 14 d Method: Method Not Specified.
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Toxicity to terrestrial organisms	:	oral LD50 (Anas platyrhynchos (Mallard duck)): > 2000 mg/kg bodyweight. dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5200 mg/kg diet. Exposure time: 8 d oral LD50 (Apis mellifera (bees)): > 100 micrograms/bee

Exposure time: 48 h

contact LD50 (Apis mellifera (bees)): > 100 micrograms/bee
Exposure time: 48 h

Ecotoxicology Assessment

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

Halauxifen-methyl:

Toxicity to fish	:	Remarks: Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species). LC50 (Rainbow trout (Oncorhynchus mykiss)): 2.01 mg/l Exposure time: 96 h Test Type: static test LC50 (Pimephales promelas (fathead minnow)): > 3.22 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.12 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 3.0 mg/l Exposure time: 96 h ErC50 (Myriophyllum spicatum): 0.000393 mg/l End point: Growth rate inhibition Exposure time: 14 d
M-Factor (Acute aquatic toxicity)	:	1,000
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.259 mg/l End point: Other Test Type: flow-through test NOEC (Cyprinodon variegatus (sheepshead minnow)): 0.00272 mg/l Exposure time: 36 d Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.484 mg/l End point: number of offspring Exposure time: 21 d Test Type: semi-static test
M-Factor (Chronic aquatic toxicity)	:	1,000
Toxicity to microorganisms	:	EC50 (activated sludge): > 981 mg/l Exposure time: 1 d

Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg Exposure time: 14 d End point: mortality
Toxicity to terrestrial organisms	:	Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm). dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5,620 ppm Exposure time: 5 d Method: Other guidelines dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5,620 ppm Exposure time: 5 d Method: Other guidelines oral LD50 (Colinus virginianus (Bobwhite quail)): > 2250 mg/kg bodyweight. End point: mortality contact LD50 (Apis mellifera (bees)): > 98.1 µg/bee Exposure time: 48 h End point: mortality oral LD50 (Apis mellifera (bees)): > 108 µg/bee Exposure time: 48 h End point: mortality

Ecotoxicology Assessment

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

Tri(2-ethylhexyl) phosphate:

Toxicity to fish	:	Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna): > 1 mg/l Exposure time: 48 h Test Type: Static Method: Method Not Specified.

2-methylpentane-2,4-diol:

Toxicity to fish	:	Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested). LC50 (Oncorhynchus mykiss (rainbow trout)): 9,450 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): 3,200 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 or Equivalent
Toxicity to algae/aquatic plants	:	ErC50 (Selenastrum capricornutum (green algae)): > 429 mg/l End point: Growth rate inhibition Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (Bacteria): > 5,000 mg/l Exposure time: 16 h Method: hUCC

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Toxicity to fish	:	Remarks: For similar material(s): 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). LC50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l Exposure time: 96 h Remarks: For similar material(s):
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 3 - 10 mg/l Exposure time: 48 h Remarks: For similar material(s):
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l Exposure time: 72 h Remarks: For similar material(s):
Toxicity to terrestrial organisms	:	Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Ecotoxicology Assessment

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

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.

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

naphthalene:

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 (Oncorhynchus mykiss (rainbow trout)): 0.11 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.6 - 24.1 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic plants : ErC50 (Skeletonema costatum (marine diatom)): 0.4 mg/l
Exposure time: 72 h
Test Type: Growth rate inhibition

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC (Other): 0.37 mg/l
End point: mortality
Exposure time: 40 d
Test Type: flow-through

M-Factor (Chronic aquatic toxicity) : 1

Ecotoxicology Assessment

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

Persistence and degradability

Components:

fluroxypyr-meptyl (ISO):

Biodegradability : Result: Not biodegradable
Remarks: Material is not readily biodegradable according to OECD/EEC guidelines.

Biodegradation: 32 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent
Remarks: 10-day Window: Fail

ThOD : 2.2 kg/kg

Stability in water : Test Type: Hydrolysis
Degradation half life: 454 d

Halauxifen-methyl:

Biodegradability : Result: Not biodegradable
Remarks: For similar active ingredient(s).
Halauxifen.
Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Biodegradation: 7.7 %
Exposure time: 28 d
Method: OECD Test Guideline 310 or Equivalent
Remarks: 10-day Window: Not applicable

Tri(2-ethylhexyl) phosphate:

Biodegradability : Result: Not biodegradable
Remarks: Material is not readily biodegradable according to OECD/EEC guidelines.

aerobic
Inoculum: activated sludge, domestic (adaptation not specified)
Concentration: 100 mg/l
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
Remarks: 10-day Window: Fail

2-methylpentane-2,4-diol:

Biodegradability	:	Result: Readily biodegradable. Remarks: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation: 81 % Exposure time: 28 d Method: OECD Test Guideline 301F or Equivalent Remarks: 10-day Window: Pass
Biochemical Oxygen Demand (BOD)	:	2 % Incubation time: 5 d 29 % Incubation time: 10 d 48 % Incubation time: 20 d
ThOD	:	2.30 kg/kg

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Biodegradability	:	Result: Not rapidly biodegradable Remarks: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

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

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.

naphthalene:

Biodegradability	:	Remarks: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).
Biochemical Oxygen Demand (BOD)	:	57.000 % Incubation time: 5 d 71.000 % Incubation time: 10 d 71.000 % Incubation time: 20 d
ThOD	:	3.00 kg/kg
Photodegradation	:	Test Type: Half-life (indirect photolysis) Sensitiser: OH radicals Concentration: 1,500,000 1/cm3 Rate constant: 2.16E-11 cm3/s Method: Estimated.

Bioaccumulative potential

Components:

fluroxypyr-meptyl (ISO):

Bioaccumulation	:	Species: Oncorhynchus mykiss (rainbow trout) Bioconcentration factor (BCF): 26 Method: Measured
Partition coefficient: n-octanol/water	:	log Pow: 5.04 Method: Measured Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

pinoxaden (ISO):

Partition coefficient: n-octanol/water	:	log Pow: 3.2 Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Cloquintocet-mexyl:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 122 - 621
Partition coefficient: n-octanol/water	:	log Pow: 5.2 (25 °C) pH: 7

Halauxifen-methyl:

Bioaccumulation	:	Species: Lepomis macrochirus (Bluegill sunfish) Bioconcentration factor (BCF): 233 Exposure time: 42 d Temperature: 21.8 °C Concentration: 0.00194 mg/l
Partition coefficient: n-octanol/water	:	log Pow: 3.76 Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Tri(2-ethylhexyl) phosphate:

Bioaccumulation	:	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 2.4 Exposure time: 42 d Method: OECD Test Guideline 305C
Partition coefficient: n-octanol/water	:	Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

2-methylpentane-2,4-diol:

Bioaccumulation	:	Bioconcentration factor (BCF): 3 Method: Calculated.
Partition coefficient: n-octanol/water	:	log Pow: 0.58 Method: Estimated. Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Partition coefficient: n-octanol/water	:	Remarks: For similar material(s): Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

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).

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).

naphthalene:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 40 - 300 Exposure time: 28 d Method: Measured
Partition coefficient: n-octanol/water	:	log Pow: 3.3 Method: Measured Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Mobility in soil

Components:

fluroxypyr-meptyl (ISO):

Distribution among environmental compartments	:	Koc: 6200 - 43000 Remarks: Expected to be relatively immobile in soil (Koc > 5000).

pinoxaden (ISO):

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

Cloquintocet-mexyl:

Distribution among environmental compartments	:	Koc: 38070 Method: Estimated. Remarks: Expected to be relatively immobile in soil (Koc > 5000).

Halauxifen-methyl:

Distribution among environmental compartments	:	Koc: 5684 Remarks: Expected to be relatively immobile in soil (Koc > 5000).

Tri(2-ethylhexyl) phosphate:

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

2-methylpentane-2,4-diol:

Distribution among environmental compartments	:	Koc: 1 Method: Estimated. Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

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

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

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

Ethylhexanol:

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

naphthalene:

Distribution among environmental compartments	:	Koc: 240 - 1300 Method: Measured Remarks: Potential for mobility in soil is medium (Koc between 150 and 500).

Other adverse effects

Components:

fluroxypyr-meptyl (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.

pinoxaden (ISO):

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.

Cloquintocet-mexyl:

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.

Halauxifen-methyl:

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.

Tri(2-ethylhexyl) phosphate:

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-methylpentane-2,4-diol:

Results of PBT and vPvB assessment	:	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.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

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.

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.

naphthalene:

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. (Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)
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. (Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)
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. (Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes(Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)
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. (Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)
Class	:	9
Packing group	:	III
Labels	:	9
ERG Code	:	171
Marine pollutant	:	yes(Fluroxypyr 1-methylheptyl ester, Halauxifen-methyl)

Further information

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).

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.

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 : 34045

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.

POTENTIAL SKIN SENSITIZER

This product is toxic to:
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
ACGIH / STEL	:	Short-term exposure limit
CA AB OEL / TWA	:	8-hour Occupational exposure limit
CA AB OEL / STEL	:	15-minute occupational exposure limit
CA AB OEL / (c)	:	ceiling occupational exposure limit
CA BC OEL / TWA	:	8-hour time weighted average
CA QC OEL / TWAEV	:	Time-weighted average exposure value
CA QC OEL / C	:	Ceiling
Corteva OEL / STEL	:	Short term exposure limit
Corteva OEL / TWA	:	Time weighted average
Corteva OEL / TWA	:	8-hr TWA
Dow IHG / TWA	:	Time Weighted Average (TWA):
Dow IHG / STEL	:	Short term exposure limit
Dow IHG / TLV-C	:	Ceiling Limit Value
Dow IHG / TWA	:	Time weighted average

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	:	11/16/2023
Date format	:	mm/dd/yyyy

Product code: GF-4270

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.

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