



Product Name: Cirpreme XC™ Herbicide

Cirpreme XC™ Herbicide is a combination of the following products:

Cirpreme A™ Herbicide, PCP: 34180

Lontrel XC™ Herbicide, PCP: 32795

The Safety Data Sheets are attached

COMPANY IDENTIFICATION

CORTEVA AGRISCIENCE CANADA COMPANY
#2450, 215 - 2ND STREET S.W.
CALGARY AB, T2P 1M4
CANADA

Customer Information Number : 800-667-3852

E-mail address : solutions@corteva.com

EMERGENCY TELEPHONE

24-Hour Emergency Contact : 1-888-226-8832

Local Emergency Contact : 1-888-226-8832

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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 : CIRPREME A
Other means of identification : No data available

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE CANADA COMPANY
#2450, 215 - 2ND STREET S.W.
CALGARY AB, T2P 1M4
CANADA

Customer Information Number : 800-667-3852
E-mail address : solutions@corteva.com

Emergency telephone number : CANUTEC
1-888-226-8832

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

Skin sensitisation : Sub-category 1B

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GHS label elements

Hazard pictograms :



Signal word : Warning
Hazard statements : H317 May cause an allergic skin reaction.

Precautionary statements :

Prevention:

P261 Avoid breathing dust.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves.

Response:

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)
Halauxifen-methyl	Halauxifen-methyl	943831-98-9	20.85
florasulam (ISO)	florasulam (ISO)	145701-23-1	20
Sodium lignosulfonate	Sodium ligno-sulfonate	8061-51-6	$\geq 10 - < 20$ *
Kaolin	Kaolin	1332-58-7	$\geq 10 - < 20$ *
citric acid	citric acid	77-92-9	$\geq 3 - < 10$ *
Sodium N-methyl-N-oleoyltaurine	Sodium N-methyl-N-oleoyltaurine	137-20-2	$\geq 1 - < 3$ *
Quartz	Quartz	14808-60-7	$\geq 0.1 - < 0.3$ *
Balance	Balance	Not Assigned	> 5

* 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.

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| 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. |
| 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. |
| 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.
Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment. |

SECTION 5. FIREFIGHTING MEASURES

- | | | |
|---|---|--|
| Suitable extinguishing media | : | Water spray
Alcohol-resistant foam |
| Unsuitable extinguishing media | : | None known. |
| Specific hazards during fire-fighting | : | Exposure to combustion products may be a hazard to health. |
| 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
Nitrogen oxides (NOx)
Hydrogen chloride gas
Hydrogen fluoride
Hydrogen cyanide (hydrocyanic acid) |
| Specific extinguishing methods | : | Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
Use water spray to cool unopened containers. |
| Further information | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment. |

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SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Avoid dust formation.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Environmental precautions : Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in.
Pick up and arrange disposal without creating dust.
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 over-pressurization of the container.
Sweep up and shovel.
Keep in suitable, closed containers for disposal.
Sweep up or vacuum up spillage and collect in suitable container for disposal.
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice.
Smoking, eating and drinking should be prohibited in the application area.
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.
Keep in properly labelled containers.
Store in accordance with the particular national regulations.
- Materials to avoid : 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
Kaolin	1332-58-7	TWA (Respirable)	2 mg/m ³	CA AB OEL
		TWA (Respirable)	2 mg/m ³	CA BC OEL

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		TWAEV (respirable dust)	2 mg/m3	CA QC OEL
		TWA (Respirable particulate matter)	2 mg/m3	ACGIH
Quartz	14808-60-7	TWA (Respirable particulates)	0.025 mg/m3	CA AB OEL
		TWA (Respirable fraction)	0.1 mg/m3	CA ON OEL
		TWAEV (respirable dust)	0.1 mg/m3	CA QC OEL
		TWA (Respirable)	0.025 mg/m3 (Silica)	CA BC OEL
		TWA (Respirable particulate matter)	0.025 mg/m3 (Silica)	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, in dusty atmospheres, use an approved particulate respirator.

Hand protection

Remarks : Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyvinyl chloride ("PVC" or "vinyl"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). 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).

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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	: Granules.
Colour	: Tan
Odour	: Mild
Odour Threshold	: No data available
pH	: 5.62 (24.5 °C) Method: pH Electrode (1% aqueous suspension)
Melting point/range	: Not determined
Freezing point	: Not applicable
Boiling point/boiling range	: Not applicable
Flash point	: Method: closed cup Not applicable
Evaporation rate	: Not applicable
Flammability (solid, gas)	: No data available
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapour pressure	: Not applicable
Relative vapour density	: Not applicable
Density	: No data available
Bulk density	: 0.59 g/m ³ (22.6 °C) Method: Loose Volumetric
Solubility(ies) Water solubility	: Not determined
Auto-ignition temperature	: Not applicable
Viscosity Viscosity, kinematic	: Not applicable
Explosive properties	: No
Oxidizing properties	: No significant increase (>5C) in temperature.

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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	:	Strong acids Strong bases
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 Nitrogen oxides (NOx) Hydrogen chloride gas Hydrogen fluoride Hydrogen cyanide (hydrocyanic acid)

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): > 5.71 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 436
Acute dermal toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg Method: OECD Test Guideline 402 Symptoms: No deaths occurred at this concentration.

Components:**Halauxifen-methyl:**

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

florasulam (ISO):

Acute oral toxicity	:	LD50 (Rat): > 6,000 mg/kg LD50 (Mouse): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 5.0 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity

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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

Sodium lignosulfonate:

Acute oral toxicity : LD50 (Rat, male and female): > 10,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): 0.48 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Kaolin:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

citric acid:

Acute oral toxicity : LD50 (Mouse): 5,400 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

LD50 (Rat): 3,000 - 12,000 mg/kg

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

Sodium N-methyl-N-oleoyltaurine:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg

Skin corrosion/irritation

Product:

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

Components:

Kaolin:

Species : Rabbit
Result : No skin irritation

citric acid:

Result : No skin irritation

Quartz:

Result : No skin irritation

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Serious eye damage/eye irritation**Product:**

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

Components:**Sodium lignosulfonate:**

Result	:	Eye irritation
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Kaolin:

Species	:	Rabbit
Result	:	No eye irritation

citric acid:

Result	:	Eye irritation
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Sodium N-methyl-N-oleoyltaurine:

Species	:	Rabbit
Result	:	Eye irritation

Quartz:

Result	:	No eye irritation
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Respiratory or skin sensitisation**Product:**

Test Type	:	Local lymph node assay
Species	:	Mouse
Assessment	:	The product is a skin sensitiser, sub-category 1B.
Method	:	OECD Test Guideline 429

Components:**Halauxifen-methyl:**

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

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

Remarks : Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

Sodium N-methyl-N-oleoyltaurine:

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

Germ cell mutagenicity**Components:****Halauxifen-methyl:**

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

florasulam (ISO):

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

Sodium lignosulfonate:

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

citric acid:

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

Sodium N-methyl-N-oleoyltaurine:

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

Quartz:

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

Carcinogenicity**Product:**

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

Components:**Halauxifen-methyl:**

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

florasulam (ISO):

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

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Kaolin:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

citric acid:

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

Quartz:

Carcinogenicity - Assessment : Human carcinogen.

Has caused cancer in humans., Has caused cancer in laboratory animals.

Reproductive toxicity

Components:

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.

florasulam (ISO):

Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction.
Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

citric acid:

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

Sodium N-methyl-N-oleoyltaurine:

Reproductive toxicity - Assessment : Screening studies suggest that this material does not affect reproduction.

Quartz:

Reproductive toxicity - Assessment : For similar material(s), 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.

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Components:

Halauxifen-methyl:

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

Kaolin:

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

citric acid:

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

Sodium N-methyl-N-oleoyltaurine:

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

Quartz:

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

STOT - repeated exposure

Components:

Quartz:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Repeated dose toxicity

Components:

Halauxifen-methyl:

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

florasulam (ISO):

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

Sodium lignosulfonate:

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

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Kaolin:

Remarks : Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.

citric acid:

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

Sodium N-methyl-N-oleoyltaurine:

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

Quartz:

Remarks : In humans, effects have been reported on the following organs:
Kidney.
Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.

Aspiration toxicity

Product:

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

Components:

Halauxifen-methyl:

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

florasulam (ISO):

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

Sodium lignosulfonate:

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

Kaolin:

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

citric acid:

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

Sodium N-methyl-N-oleoyltaurine:

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

Quartz:

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

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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

- 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*)): 35 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: semi-static test
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants :
- ErC50 (*Pseudokirchneriella subcapitata* (green algae)): 0.0478 mg/l
Exposure time: 72 h
Test Type: static test
- ErC50 (*Myriophyllum spicatum*): 0.00387 mg/l
Exposure time: 14 d
Test Type: static test
- NOEC (*Myriophyllum spicatum*): 0.000305 mg/l
Exposure time: 14 d
Test Type: static test
- EC50 (*Lemna gibba* (duckweed)): 0.0017 mg/l
Exposure time: 7 d
Test Type: Growth inhibition
Method: OECD Test Guideline 221
- Toxicity to soil dwelling organisms : LC50 (*Eisenia andrei* (red worm)): > 1,000 mg/kg
Exposure time: 14 d
Method: OECD Test Guideline 207
- Toxicity to terrestrial organisms :
- Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
- oral LD50 (*Colinus virginianus* (Bobwhite quail)): > 2000 mg/kg bodyweight.
- oral LD50 (*Anas platyrhynchos* (Mallard duck)): > 2000 mg/kg bodyweight.
- oral LD50 (*Apis mellifera* (bees)): > 212.6 µg/bee
Exposure time: 48 h
- contact LD50 (*Apis mellifera* (bees)): > 200 µg/bee
Exposure time: 48 h

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Components:**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).

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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.

florasulam (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)): > 100 mg/l

Exposure time: 96 h

Test Type: static test

Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other : EC50 (*Daphnia magna* (Water flea)): > 292 mg/l

aquatic invertebrates

Exposure time: 48 h

Test Type: static test

Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants

: ErC50 (*Pseudokirchneriella subcapitata* (green algae)): 0.00894 mg/l

End point: Growth rate inhibition

Exposure time: 72 h

Test Type: static test

Method: OECD Test Guideline 201 or Equivalent

EC50 (*Myriophyllum spicatum*): > 0.305 mg/l

End point: Growth inhibition

Exposure time: 14 d

M-Factor (Acute aquatic toxicity) : 100

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- Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): 119 mg/l
End point: mortality
Exposure time: 28 d
Test Type: flow-through test
- NOEC (Pimephales promelas (fathead minnow)): > 2.9 mg/l
End point: Other
Exposure time: 33 d
Test Type: flow-through test
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 38.90 mg/l
End point: growth
Exposure time: 21 d
Test Type: semi-static test
- MATC (Maximum Acceptable Toxicant Level) (Daphnia magna (Water flea)): 50.2 mg/l
End point: growth
Exposure time: 21 d
Test Type: semi-static test
- M-Factor (Chronic aquatic toxicity) : 100
- Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): > 1,320 mg/kg
Exposure time: 14 d
- Toxicity to terrestrial organisms : 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 (Coturnix japonica (Japanese quail)): 1047 mg/kg bodyweight.
- dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5,000 ppm
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

Sodium lignosulfonate:

- 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 (Pimephales promelas (fathead minnow)): 615 mg/l
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent
Remarks: For this family of materials:

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citric acid:

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 (Lepomis macrochirus (Bluegill sunfish)): 1,516 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent

LC50 (Leuciscus idus (Golden orfe)): 440 - 760 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,535 mg/l
Exposure time: 24 h
Test Type: Static
Method: OECD Test Guideline 202 or Equivalent

Sodium N-methyl-N-oleoyltaurine:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 1.32 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 5.76 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 197 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 2 mg/l
Exposure time: 21 d

Quartz:

Toxicity to fish : Remarks: Not expected to be acutely toxic to aquatic organisms.

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Persistence and degradability

Components:

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

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florasulam (ISO):

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

Biodegradation: 2 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Fail

Biochemical Oxygen Demand (BOD) : 0.012 kg/kg
Incubation time: 5 d

ThOD : 0.85 kg/kg

Stability in water : Degradation half life: > 30 d

Photodegradation : Rate constant: 7.04E-11 cm³/s
Method: Estimated.

Sodium lignosulfonate:

Biodegradability : Remarks: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Biodegradation: < 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301E
Remarks: 10-day Window: Fail

Photodegradation : Rate constant: 1.089E-10 cm³/s
Method: Estimated.

citric acid:

Biodegradability : Remarks: Material is expected to be readily biodegradable. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

aerobic
Result: Readily biodegradable.
Biodegradation: 97 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Pass

aerobic
Biodegradation: 98 %
Exposure time: 7 d
Method: OECD Test Guideline 302B or Equivalent
Remarks: 10-day Window: Not applicable

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Sodium N-methyl-N-oleoyltaurine:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Pass
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Quartz:

Biodegradability : Remarks: Biodegradation is not applicable.

Bioaccumulative potential

Components:

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).

florasulam (ISO):

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 0.8
Exposure time: 28 d
Temperature: 13 °C
Method: Measured

Partition coefficient: n-octanol/water :
log Pow: -1.22
pH: 7.0
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Sodium lignosulfonate:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 3.2

Partition coefficient: n-octanol/water :
log Pow: -3.45
Method: Estimated.
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

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citric acid:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 0.01 Method: Measured
Partition coefficient: n-octanol/water	:	log Pow: -1.72 (20 °C) Method: Measured Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Sodium N-methyl-N-oleoyltaurine:

Partition coefficient: n-octanol/water	:	Pow: 1.36 (20 °C) Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
--	---	---

Quartz:

Partition coefficient: n-octanol/water	:	Remarks: Partitioning from water to n-octanol is not applicable.
--	---	--

Balance:

Partition coefficient: n-octanol/water	:	Remarks: No relevant data found.
--	---	----------------------------------

Mobility in soil

Components:

Halauxifen-methyl:

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

florasulam (ISO):

Distribution among environmental compartments	:	Koc: 4 - 54 Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).
---	---	---

Stability in soil	:	Dissipation time: 0.7 - 4.5 d
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Sodium lignosulfonate:

Distribution among environmental compartments	:	Koc: > 99999 Method: Estimated. Remarks: Expected to be relatively immobile in soil (Koc > 5000).
---	---	---

citric acid:

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

Quartz:

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

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

Other adverse effects

Components:

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.

florasulam (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.

Sodium lignosulfonate:

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.

Kaolin:

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.

citric acid:

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.

Sodium N-methyl-N-oleoyltaurine:

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.

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Quartz:

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.

Balance:

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 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(Florasulam, Halauxifen-methyl)
Class : 9
Packing group : III
Labels : 9

IATA-DGR

UN/ID No. : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s.
(Florasulam, Halauxifen-methyl)
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 956
Packing instruction (passenger aircraft) : 956

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IMDG-Code

UN number	: UN 3077
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Florasulam, Halauxifen-methyl)
Class	: 9
Packing group	: III
Labels	: 9
EmS Code	: F-A, S-F
Marine pollutant	: yes
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 3077
Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Florasulam, Halauxifen-methyl)
Class	: 9
Packing group	: III
Labels	: 9
ERG Code	: 171
Marine pollutant	: yes(Florasulam, Halauxifen-methyl)

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.
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Pest Control Products Act (PCPA) Registration Number : 34180

Read the PCPA label, authorized under the Pest Control Products Act, prior to using or handling this pest control product.

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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 ON OEL	:	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
CA QC OEL	:	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for air-borne contaminants
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 ON OEL / TWA	:	Time-Weighted Average Limit (TWA)
CA QC OEL / TWA	:	Time-weighted average exposure value

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

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Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Revision Date : 10/12/2022
Date format : mm/dd/yyyy

Product code: GF-2687

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



SAFETY DATA SHEET

CORTEVA AGRISCIENCE CANADA COMPANY

Product name: LONTREL™ XC Herbicide

Issue Date: 11/25/2020

CORTEVA AGRISCIENCE CANADA COMPANY 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.

1. IDENTIFICATION

Product name: LONTREL™ XC Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

CORTEVA AGRISCIENCE CANADA COMPANY

#2450, 215 - 2ND STREET S.W.

CALGARY AB, T2P 1M4

CANADA

Customer Information Number

: 800-667-3852

E-mail address

: solutions@corteva.com

EMERGENCY TELEPHONE

24-Hour Emergency Contact

: 1-888-226-8832

Local Emergency Contact

: 1-888-226-8832

2. HAZARDS IDENTIFICATION

Hazard classification

This product is not hazardous under the criteria of the Hazardous Products Regulation (HPR) as implemented under the Workplace Hazardous Materials Information System (WHMIS 2015).

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Clopyralid-dimethylammonium salt	1096483-37-2	60.2%
Balance	Not available	39.8%

4. FIRST AID MEASURES

Description of first aid measures

General advice:

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

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

Skin contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

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.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed:

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: 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.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

Hazardous combustion products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Consult local authorities for recommended exposure limits.

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid
Color	Blue
Odor	Characteristic
Odor Threshold	No test data available
pH	3.7 1% pH Electrode (1% aqueous suspension)
Melting point/range	Not applicable
Freezing point	No data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup > 100 °C Pensky-Martens Closed Cup ASTM D 93
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No data available
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.229 at 20.0 °C / 4 °C Digital Density Meter (Oscillating Coil)
Water solubility	No test data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No data available
Dynamic Viscosity	13.4 mPa.s at 20 °C 6.7 mPa.s at 40 °C
Kinematic Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No significant increase (>5C) in temperature.
Molecular weight	No data available

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Some components of this product can decompose at elevated temperatures.

Incompatible materials: Avoid contact with: Strong acids. Strong oxidizers.

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

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:

LD50, Rat, female, > 5,000 mg/kg

Acute dermal toxicity

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

As product:

LD50, Rat, male and female, > 5,000 mg/kg OECD Test Guideline 402

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to mist. Based on the available data, narcotic effects were not observed. Based on the available data, respiratory irritation was not observed.

As product:

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.12 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation

May cause slight temporary eye irritation.

Corneal injury is unlikely.

Sensitization

For skin sensitization:

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For similar active ingredient(s).

Clopyralid.

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

Carcinogenicity

For similar active ingredient(s). Clopyralid. Did not cause cancer in laboratory animals.

Teratogenicity

For similar active ingredient(s). Clopyralid caused birth defects in test animals, but only at greatly exaggerated doses that were severely toxic to the mothers. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure.

Reproductive toxicity

For similar active ingredient(s). Clopyralid. In animal studies, did not interfere with reproduction.

Mutagenicity

For similar active ingredient(s). Clopyralid. In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Toxicity

Clopyralid-dimethylammonium salt

Acute toxicity to fish

For similar material(s):

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

For similar material(s):

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, > 99.9 mg/l

For similar material(s):

LC50, Lepomis macrochirus (Bluegill sunfish), 96 Hour, > 102 mg/l

Acute toxicity to aquatic invertebrates

For similar material(s):

Material is practically non-toxic to aquatic invertebrates on an acute basis (LC50/EC50 > 100 mg/L).

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 99 mg/l

Acute toxicity to algae/aquatic plants

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).

For similar material(s):

ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate inhibition, 33.1 mg/l

For similar material(s):

ErC50, Myriophyllum spicatum, 14 d, > 3 mg/l

For similar material(s):

NOEC, Myriophyllum spicatum, 14 d, 0.0089 mg/l

Balance**Acute toxicity to fish**

No relevant data found.

Persistence and degradability**Clopyralid-dimethylammonium salt**

Biodegradability: For similar active ingredient(s). Clopyralid. Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential**Clopyralid-dimethylammonium salt**

Bioaccumulation: For similar active ingredient(s). Clopyralid. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Balance

Bioaccumulation: No relevant data found.

Mobility in soil**Clopyralid-dimethylammonium salt**

For similar active ingredient(s).

Clopyralid.

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

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

TDG

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

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

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

National Fire Code of Canada

Not applicable

Canadian Domestic Substances List (DSL)

This product contains chemical substance(s) exempt from CEPA DSL Inventory requirements. It is regulated as a pesticide subject to Pest Control Products Act (PCPA) requirements.

Pest Control Products Act

Pest Control Products Act (PCPA) Registration Number: 32795

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.

This product is toxic to:

Non-target terrestrial plants

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Flammability	Instability
0	1	0

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; AIIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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.

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

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