

SAFETY DATA SHEET

according to the OSHA Hazard Communication Standard



TOLVERA™

Version	Revision Date:	SDS Number:	Date of last issue: 07/05/2024
1.3	07/30/2024	800080100289	Date of first issue: 04/18/2022

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 the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : TOLVERA™

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information Number : 1-800-258-3033
E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224)
+1 800-992-5994 or +1 317-337-6009

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 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	: Category 4
Acute toxicity (Oral)	: Category 4
Serious eye damage	: Category 1
Skin sensitization	: Category 1
Carcinogenicity	: Category 2
Reproductive toxicity	: Category 2
Specific target organ toxicity - single exposure	: Category 3 (Central nervous system)

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Specific target organ toxicity : Category 2 (Eyes, Kidney, Liver)
- repeated exposure (Oral)

Aspiration hazard : Category 1

GHS label elements

Hazard pictograms



Signal Word : Danger

Hazard Statements : H227 Combustible liquid.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs (Eyes, Kidney, Liver) through prolonged or repeated exposure if swallowed.

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/ sparks/ open flames/ hot surfaces. No smoking.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must 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 soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

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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.
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:

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

Additional Labeling

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 1 %

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
bromoxynil octanoate (ISO)	1689-99-2	25.62
Tolpyralate	1101132-67-5	1.76
Cloquintocet-mexyl	99607-70-2	0.44
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	>= 30 - < 40
benzyl alcohol	100-51-6	>= 20 - < 25
Ethoxylated fatty alcohol	78330-21-9	>= 10 - < 20
naphthalene	91-20-3	>= 0.1 - < 0.3

Actual concentration 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	:	Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5

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	:	minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.
If swallowed	:	If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.
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	:	Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO ₂)
Unsuitable extinguishing media	:	Do not use direct water stream. High volume water jet
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health. Vapors 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. Use water spray to cool unopened 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.
Further information	:	Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.

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Special protective equipment : Do not use a solid water stream as it may scatter and spread fire.
for fire-fighters : Use a water spray to cool fully closed containers.
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 over-pressurization 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/vapors/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 : To avoid spills during handling keep bottle on a metal tray.

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Avoid formation of aerosol.
Persons susceptible to skin sensitization 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 vapors/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.
Do not breathe vapors or spray mist.
Do not swallow.
Do not get in eyes.
Avoid contact with skin and 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 labeled 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

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
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)	ACGIH
benzyl alcohol	100-51-6	TWA	10 ppm	US WEEL
naphthalene	91-20-3	TWA	10 ppm	Dow IHG

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		STEL	15 ppm	Dow IHG
		TWA	10 ppm	ACGIH
		TWA	10 ppm 50 mg/m3	OSHA Z-1
		TWA	10 ppm 50 mg/m3	OSHA P0
		STEL	15 ppm 75 mg/m3	OSHA P0

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: 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.

Eye protection : Use chemical goggles.

Skin and body protection : Wear clean, body-covering clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Color : Amber to black

Odor : mild

Odor Threshold : No data available

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pH	:	4.9 (68 °F / 20 °C) No data available
Melting point/range	:	Not applicable
Freezing point	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	151 °F / 66 °C Method: EC Method A9, 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
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	1.06 Method: OECD Test Guideline 109
Density	:	No data available
Solubility(ies) Water solubility	:	No data available
Autoignition temperature	:	No data available
Viscosity Viscosity, dynamic	:	No data available
Explosive properties	:	Not explosive
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.

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Vapors may form explosive mixture with air.
May form explosive dust-air mixture.

Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Strong acids Strong bases Strong oxidizing agents
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

Components:

bromoxynil octanoate (ISO):

Acute oral toxicity	:	LD50 (Rat): 238 mg/kg Assessment: The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	:	LC50 (Rat): 4 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

Tolpyralate:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 311 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

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

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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: vapor 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):

benzyl alcohol:

Acute oral toxicity	:	LD50 (Rat, male): 1,620 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 4.178 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403
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

Ethoxylated fatty alcohol:

Acute oral toxicity	:	LD50 (Rat): 500 - 2,000 mg/kg
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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.
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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: vapor
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

Components:

benzyl alcohol:

Species	: Rabbit
Exposure time	: 4 h
Method	: OECD Test Guideline 404
Result	: No skin irritation
GLP	: yes

Serious eye damage/eye irritation

Components:

benzyl alcohol:

Species	: Rabbit
Result	: Eye irritation
Exposure time	: 24 h
Method	: OECD Test Guideline 405
GLP	: yes

Ethoxylated fatty alcohol:

Result	: Corrosive
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Respiratory or skin sensitization

Product:

Species : Guinea pig

Components:

bromoxynil octanoate (ISO):

Result : May cause sensitization by skin contact.

Tolpyralate:

Remarks : For skin sensitization:
Did not cause sensitization on laboratory animals.

Remarks : For respiratory sensitization:
No relevant data found.

Cloquintocet-mexyl:

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

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.

benzyl alcohol:

Species : Mouse
Method : OECD Test Guideline 429
Result : Does not cause skin sensitization.

naphthalene:

Assessment : Does not cause skin sensitization.
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:

Tolpyralate:

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Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

Cloquintocet-mexyl:

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

benzyl alcohol:

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

naphthalene:

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

Carcinogenicity

Components:

Tolpyralate:

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

Cloquintocet-mexyl:

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

benzyl alcohol:

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

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.

IARC	Group 2B: Possibly carcinogenic to humans naphthalene	91-20-3
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OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
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NTP	Reasonably anticipated to be a human carcinogen naphthalene	91-20-3
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Reproductive toxicity

Components:

bromoxynil octanoate (ISO):

Reproductive toxicity - Assessment : Suspected human reproductive toxicant

Tolpyralate:

Reproductive toxicity - Assessment : In animal studies, did not 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.

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.

benzyl alcohol:

Reproductive toxicity - Assessment : Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

naphthalene:

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

STOT-single exposure

Components:

Tolpyralate:

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

Cloquintocet-mexyl:

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

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

Routes of exposure : Inhalation
Assessment : May cause drowsiness or dizziness.

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benzyl alcohol:

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

Ethoxylated fatty alcohol:

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

naphthalene:

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

STOT-repeated exposure

Components:

Tolpyralate:

Routes of exposure : Oral
Target Organs : Eyes, Kidney, Liver
Assessment : May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

Tolpyralate:

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

Cloquintocet-mexyl:

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

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

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

benzyl alcohol:

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Remarks : In animals, effects have been reported on the following organs after inhalation:
Central nervous system.
Muscles.
Thymus.
Urinary tract.
Based on available data, repeated exposures to small amounts are not anticipated to cause significant adverse effects.

Ethoxylated fatty alcohol:

Remarks : No relevant data found.

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

Components:

Tolpyralate:

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

Cloquintocet-mexyl:

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

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

May be fatal if swallowed and enters airways.

benzyl alcohol:

Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

Ethoxylated fatty alcohol:

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

naphthalene:

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

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SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

bromoxynil octanoate (ISO):

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0.1 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.11 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapita): 0.21 mg/l Exposure time: 72 h

Tolpyralate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 1,000 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	NOEC (Lemna gibba (gibbous duckweed)): 0.00102 mg/l Exposure time: 7 d ErC50 (Lemna gibba (gibbous duckweed)): > 0.244 mg/l Exposure time: 7 d ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l Exposure time: 96 h
M-Factor (Chronic aquatic toxicity)	:	1

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.

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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.

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.

benzyl alcohol:

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Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 460 mg/l
Exposure time: 96 h
Test Type: Static
Method: Method Not Specified.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 230 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 770 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: Static
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 310 mg/l
Exposure time: 72 h
Test Type: Static
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna): 51 mg/l
Exposure time: 21 d
Test Type: semi-static test
Method: OECD Test Guideline 211

Toxicity to microorganisms : EC50 (activated sludge): 2,100 mg/l
End point: Respiration rates.
Exposure time: 49 h
Test Type: Respiration inhibition
Method: OECD 209 Test

Ethoxylated fatty alcohol:

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).

LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : LC50 (Crangon crangon (shrimp)): 36 mg/l
Exposure time: 96 h
Remarks: For similar material(s):

Ecotoxicology Assessment

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

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).

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	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:

Tolpyralate:

Biodegradability : Result: Readily biodegradable.
Remarks: Material is expected to be readily biodegradable.

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

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

benzyl alcohol:

Biodegradability : Inoculum: activated sludge, domestic (adaptation not specified)
Concentration: 100 mg/l
Result: Readily biodegradable.
Biodegradation: 92 - 96 %
Exposure time: 14 d
Method: OECD Test Guideline 301C or Equivalent
Remarks: 10-day Window: Not applicable

ThOD : 2.52 kg/kg

Photodegradation : Test Type: Half-life (indirect photolysis)

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Sensitizer: OH radicals
Rate constant: 8.25E-12 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)
Sensitizer: OH radicals
Concentration: 1,500,000 1/cm³
Rate constant: 2.16E-11 cm³/s
Method: Estimated.

Bioaccumulative potential

Components:

Tolpyralate:

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

Partition coefficient: n-octanol/water : log Pow: 1.9

Cloquintocet-mexyl:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 122 - 621

Partition coefficient: n-octanol/water : log Pow: 5.2 (77 °F / 25 °C)
pH: 7

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).

benzyl alcohol:

Partition coefficient: n-octanol/water : log Pow: 1.10
Method: Measured

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

Ethoxylated fatty alcohol:

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

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:

Cloquintocet-mexyl:

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

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

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

benzyl alcohol:

Distribution among environmental compartments : Koc: 16
Method: Estimated.
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Ethoxylated fatty alcohol:

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

naphthalene:

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

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Other adverse effects

Components:

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.

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.

benzyl alcohol:

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.

Ethoxylated fatty alcohol:

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.

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.

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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. (Bromoxynil octanoate)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	no

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Bromoxynil octanoate)
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. (Bromoxynil octanoate)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes(Bromoxynil octanoate)
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.

Domestic regulation

49 CFR Road

UN/ID/NA number	:	NA 1993
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Proper shipping name	:	Combustible liquid, n.o.s. (Heavy aromatic naphtha)
Class	:	CBL
Packing group	:	III
Labels	:	NONE
ERG Code	:	128
Marine pollutant	:	no

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 5L 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.

According to 49 CFR 173.150 (f) 2 this product is only classified in containers over 119 gallons or 450 liters. Not regulated if shipped in packages less than or equal to 119 gallons (450 liters). If transporting by vessel or aircraft unless other means of transportation is impracticable, the product must be shipped as a flammable liquid.

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

SARA 311/312 Hazards	:	Flammable (gases, aerosols, liquids, or solids) Acute toxicity (any route of exposure) Respiratory or skin sensitization Carcinogenicity Reproductive toxicity Specific target organ toxicity (single or repeated exposure) Aspiration hazard Serious eye damage or eye irritation
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SARA 313	:	The following components are subject to reporting levels established by SARA Title III, Section 313:
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bromoxynil octanoate (ISO)	1689-99-2	>= 20 - < 30 %
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naphthalene	91-20-3	>= 0.1 - < 1 %
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US State Regulations

Pennsylvania Right To Know

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5
benzyl alcohol	100-51-6

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California Prop. 65

WARNING: This product can expose you to chemicals including naphthalene, which is/are known to the State of California to cause cancer, and bromoxynil octanoate (ISO), which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

The following substance(s) is/are subject to a Significant New Use Rule:

Cloquintocet-mexyl 99607-70-2 See 40 CFR § 721.304; Final Rule

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-761

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING

May be fatal if swallowed.

May be fatal if absorbed through skin

Causes moderate eye irritation.

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

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)
Corteva OEL	:	Corteva Occupational Exposure Limit
Dow IHG	:	Dow Industrial Hygiene Guideline
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average

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Corteva OEL / STEL	:	Short term exposure limit
Corteva OEL / TWA	:	Time weighted average
Dow IHG / STEL	:	Short term exposure limit
Dow IHG / TWA	:	Time weighted average
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
US WEEL / TWA	:	8-hr TWA

ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; ASTM - American Society for the Testing of Materials; ECx - Concentration associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - not otherwise specified; NOEC - Non-Observed Effective Concentration; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; (Q)SAR - (Quantitative) Structure Activity Relationship; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SDS - Safety Data Sheet; UN - United Nations. CFR - Code of Federal Regulations. IARC - International Agency for Research on Cancer. IATA-DGR - International Air Transport Association Dangerous Goods Regulations. OSHA - Occupational Safety and Health Administration. RCRA - Resource Conservation and Recovery Act. RQ - Reportable Quantity. SARA - Superfund Amendments and Reauthorization Act. TSCA - Toxic Substances Control Act.

Revision Date : 07/30/2024

Product code: GF-5036

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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