

SAFETY DATA SHEET



Enlist Duo®

Version 1.0 Revision Date: 01/19/2022 SDS Number: 800080002768 Date of last issue: -
Date of first issue: 01/19/2022

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 : Enlist Duo®

Manufacturer or supplier's details

COMPANY IDENTIFICATION

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

Customer Information Number : 800-992-5994

E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).
800-992-5994 or 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)

Skin sensitization : Sub-category 1B

GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H317 May cause an allergic skin reaction.

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Precautionary Statements : **Prevention:**
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing 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	CAS-No.	Concentration (% w/w)
2,4-D choline salt	1048373-72-3	24.4
Glyphosate DMA Salt	34494-04-7	22.1
Propylene glycol	57-55-6	>= 3 - < 10
LAURYLDIMETHYLAMINE OXIDE	1643-20-5	>= 1 - < 3
Balance	Not Assigned	> 40

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

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

In case of skin contact : Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.
Suitable emergency safety shower facility should be available in work area.

In case of eye contact : Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.
Suitable emergency eye wash facility should be available in

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- If swallowed : work area.
: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor.
: Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : None known.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).
: If potential for exposure exists refer to Section 8 for specific personal protective equipment.
- Notes to physician : No specific antidote.
: Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.
: Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.
: Skin contact may aggravate preexisting dermatitis.
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SECTION 5. FIRE-FIGHTING 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.
: Do not allow run-off from firefighting to enter drains or water courses.
- Hazardous combustion products : During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.
: Combustion products may include and are not limited to:
: Carbon oxides
- Specific extinguishing methods : Remove undamaged containers from fire area if it is safe to do so.
: Evacuate area.
: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
: Use water spray to cool unopened containers.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
: Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.
: Use personal protective equipment.
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SECTION 6. ACCIDENTAL RELEASE MEASURES

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- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Environmental precautions : If the product contaminates rivers and lakes or drains inform respective authorities.
Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Prevent spreading over a wide area (e.g., by containment or oil barriers).
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.
Prevent from entering into soil, ditches, sewers, underwater.
See Section 12, Ecological Information.
- Methods and materials for containment and cleaning up : Clean up remaining materials from spill with suitable absorbent.
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).
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Do not breathe 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.
Avoid inhalation of vapor or mist.
Do not swallow.
Avoid contact with skin and eyes.
Avoid contact with eyes.
Take care to prevent spills, waste and minimize release to the

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- environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
- Conditions for safe storage : Store in a closed container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labeled 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

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2,4-D choline salt	1048373-72-3	TWA	10 mg/m ³	Dow IHG
Propylene glycol	57-55-6	TWA	10 mg/m ³	US WEEL

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

Personal protective equipment

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

- Remarks : Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. 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.

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Color : Brown

Odor : Amine.

Odor Threshold : No data available

pH : 5.6 - 6.17
Method: pH Electrode

Melting point/range : Not applicable

Freezing point : No data available

Boiling point/boiling range : No data available

Flash point : > 212 °F / > 100 °C
Method: Pensky-Martens Closed Cup ASTM D 93, closed cup

Evaporation rate : 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

Density : 1.17 g/cm³ (68.0 °F / 20.0 °C)
Method: Digital density meter

Solubility(ies)
Water solubility : No data available

Partition coefficient: n-octanol/water : No data available.

Autoignition temperature : No data available

Viscosity
Viscosity, dynamic : 32.7 mPa.s (68.0 °F / 20.0 °C)
14.9 mPa.s (104.0 °F / 40.0 °C)

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26.3 cP (77 °F / 25 °C)

Explosive properties : No

Oxidizing properties : yes

Reference substance: Potassium permanganate

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : No decomposition if stored and applied as directed.
Stable under normal conditions.
Possibility of hazardous reactions : Stable under recommended storage conditions.
No hazards to be specially mentioned.
None known.
Conditions to avoid : None known.
Incompatible materials : None.
Hazardous decomposition products : Decomposition products depend upon temperature, air supply and the presence of other materials.
Decomposition products can include and are not limited to:
Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity : LD50 (Rat, female): 2,500 mg/kg
Method: OECD Test Guideline 425
Acute inhalation toxicity : LC50 (Rat, male and female): > 5.10 mg/l
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 402

Components:

2,4-D choline salt:

Acute oral toxicity : LD50 (Rat): 639 mg/kg
Remarks: For similar active ingredient(s).
Acute inhalation toxicity : Remarks: At room temperature, exposures to vapors are minimal due to physical properties; higher temperatures may

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generate vapor levels sufficient to cause irritation and other effects.
Prolonged excessive exposure to dust may cause adverse effects.
Dust may cause irritation to upper respiratory tract (nose and throat).

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

Acute dermal toxicity : LD50 (Rabbit, male and female): > 5,000 mg/kg
Remarks: For similar active ingredient(s).

Glyphosate DMA Salt:

Acute oral toxicity : LD50 (Rat): > 4,000 mg/kg
Remarks: For similar active ingredient(s).

Acute inhalation toxicity : Remarks: Prolonged excessive exposure to dust may cause adverse effects.

LC50 (Rat): > 1.9 mg/l
Test atmosphere: dust/mist
Remarks: For similar active ingredient(s).

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Remarks: For similar active ingredient(s).

Propylene glycol:

Acute oral toxicity : LD50 (Rat): > 20,000 mg/kg

Acute inhalation toxicity : LC50 (Rabbit): 317.042 mg/l
Exposure time: 2 h
Test atmosphere: dust/mist
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Mist may cause irritation of upper respiratory tract (nose and throat).

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

LAURYL DIMETHYLAMINE OXIDE:

Acute oral toxicity : LD50 (Mouse): 2,700 mg/kg
Remarks: There may be a feeling of bloating or distension in

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the abdomen, nausea, vomiting and diarrhea.

Skin corrosion/irritation**Product:**

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

Components:**2,4-D choline salt:**

Result : No skin irritation

Propylene glycol:

Species : Rabbit
Result : No skin irritation

LAURYL DIMETHYLAMINE OXIDE:

Result : Skin irritation

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

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

Components:**2,4-D choline salt:**

Result : Corrosive

Propylene glycol:

Species : Rabbit
Result : No eye irritation

LAURYL DIMETHYLAMINE OXIDE:

Result : Eye irritation

Respiratory or skin sensitization**Product:**

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

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Components:**2,4-D choline salt:**

Assessment : Does not cause skin sensitization.
Remarks : Did not cause allergic skin reactions when tested in guinea pigs.
Did not demonstrate the potential for contact allergy in mice.

Remarks : For respiratory sensitization:
No relevant data found.

Propylene glycol:

Species : human
Assessment : Does not cause skin sensitization.

Germ cell mutagenicity**Components:****2,4-D choline salt:**

Germ cell mutagenicity - Assessment : For similar active ingredient(s), 2,4-Dichlorophenoxyacetic acid., In vitro genetic toxicity studies were predominantly negative.

Glyphosate DMA Salt:

Germ cell mutagenicity - Assessment : For similar active ingredient(s), Glyphosate., In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Propylene glycol:

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

Carcinogenicity**Product:**

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

Components:**2,4-D choline salt:**

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

Glyphosate DMA Salt:

Carcinogenicity - Assessment : For similar active ingredient(s), Glyphosate., Did not cause cancer in laboratory animals., Weight of evidence evaluation

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of epidemiology studies supports no association between glyphosate exposure and cancer.

Propylene glycol:

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

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Components:****2,4-D choline salt:**

Reproductive toxicity - Assessment : For similar active ingredient(s), 2,4-Dichlorophenoxyacetic acid., In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.
For similar active ingredient(s), 2,4-Dichlorophenoxyacetic acid., Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Glyphosate DMA Salt:

Reproductive toxicity - Assessment : For similar active ingredient(s), Glyphosate., In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.
For similar active ingredient(s), Glyphosate., Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

Propylene glycol:

Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction., In animal studies, did not interfere with fertility.
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:

2,4-D choline salt:

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

Glyphosate DMA Salt:

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

Propylene glycol:

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

LAURYL DIMETHYLAMINE OXIDE:

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

Repeated dose toxicity

Components:

2,4-D choline salt:

Remarks : For similar active ingredient(s).
2,4-Dichlorophenoxyacetic acid.
In animals, effects have been reported on the following organs:
Liver.
Kidney.
Muscles.
Observations in animals include:
Gastrointestinal irritation.
Vomiting.

Glyphosate DMA Salt:

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

Propylene glycol:

Remarks : In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

LAURYL DIMETHYLAMINE OXIDE:

Remarks : No relevant data found.

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Aspiration toxicity**Product:**

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

Components:**2,4-D choline salt:**

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

Glyphosate DMA Salt:

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

Propylene glycol:

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

LAURYL DIMETHYLAMINE OXIDE:

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

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Product:**

- Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 59.2 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 62.02 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (microalgae)): 13.18 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
- Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): > 2,000 mg/kg
Exposure time: 14 d
- Toxicity to terrestrial organisms : oral LD50 (Colinus virginianus (Bobwhite quail)): 1688 mg/kg bodyweight.
End point: mortality
- contact LD50 (Apis mellifera (bees)): > 200 µg/bee
Exposure time: 48 h
End point: mortality

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Method: Other guidelines

oral LD50 (*Apis mellifera* (bees)): > 206 µg/bee
 Exposure time: 48 h
 End point: mortality
 Method: Other guidelines

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

Components:**2,4-D choline salt:**

Toxicity to fish : Remarks: For similar active ingredient(s).
 Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

LC50 (*Poecilia reticulata* (guppy)): 8.4 - 70.7 mg/l
 Exposure time: 96 h
 Test Type: static test
 Remarks: For similar active ingredient(s).

Toxicity to daphnia and other aquatic invertebrates : LC50 (*Pteronarcys californica*): 1.6 - 15 mg/l
 Exposure time: 96 h
 Test Type: static test

Toxicity to algae/aquatic plants : EC50 (*Pseudokirchneriella subcapitata* (green algae)): 24.2 mg/l
 Exposure time: 96 h
 Test Type: static test
 Remarks: For similar material(s):

EC50 (*Lemna gibba*): 0.58 mg/l
 Exposure time: 14 d
 Remarks: For similar material(s):

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (*Daphnia magna* (Water flea)): 79 mg/l
 End point: number of offspring
 Exposure time: 21 d
 Remarks: Information refers to the main ingredient.

Toxicity to terrestrial organisms : Remarks: For similar active ingredient(s)., 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).

dietary LC50 (*Colinus virginianus* (Bobwhite quail)): > 5620 mg/kg diet.
 Remarks: For similar active ingredient(s).

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

Remarks: For similar active ingredient(s).

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

Remarks: For similar active ingredient(s).

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Glyphosate DMA Salt:

Toxicity to fish : Remarks: For similar active ingredient(s).
Glyphosate.

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

LC50 (*Oncorhynchus mykiss* (rainbow trout)): 38 mg/l

Exposure time: 96 h

Remarks: For similar material(s):

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna*): 40 mg/l
Exposure time: 48 h

Remarks: For similar active ingredient(s).

Toxicity to algae/aquatic plants : ErC50 (*Lemna gibba*): 12 mg/l
End point: Growth rate inhibition
Exposure time: 14 d

Remarks: For similar material(s):

ErC50 (*Pseudokirchneriella subcapitata* (green algae)): 19 mg/l

End point: Growth rate inhibition

Exposure time: 72 h

Remarks: For similar material(s):

ErC50 (*Skeletonema costatum* (marine diatom)): 18 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)., Material is slightly toxic to birds on a dietary basis (LC50 between 1001 and 5000 ppm).

Ecotoxicology Assessment

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

Propylene glycol:

Toxicity to fish : LC50 (*Oncorhynchus mykiss* (rainbow trout)): 40,613 mg/l
Exposure time: 96 h
Test Type: static test

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Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : LC50 (Ceriodaphnia dubia (water flea)): 18,340 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)): 19,000 mg/l
 End point: Growth rate inhibition
 Exposure time: 96 h
 Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (water flea)): 13,020 mg/l
 End point: number of offspring
 Exposure time: 7 d
 Test Type: semi-static test

Toxicity to microorganisms : NOEC (Pseudomonas putida): > 20,000 mg/l
 Exposure time: 18 h

Persistence and degradability**Components:****2,4-D choline salt:**

Biodegradability : Remarks: For similar active ingredient(s).
 Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

Glyphosate DMA Salt:

Biodegradability : Result: Not readily biodegradable.
 Remarks: For similar active ingredient(s).
 Glyphosate.
 Biodegradation may occur under aerobic conditions (in the presence of oxygen).
 Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Propylene glycol:

Biodegradability : aerobic
 Result: Readily biodegradable.
 Biodegradation: 81 %
 Exposure time: 28 d
 Method: OECD Test Guideline 301F or Equivalent
 Remarks: 10-day Window: Pass

Biodegradation: 96 %
 Exposure time: 64 d
 Method: OECD Test Guideline 306 or Equivalent
 Remarks: 10-day Window: Not applicable

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Biochemical Oxygen Demand (BOD) : 69.000 %
Incubation time: 5 d
70.000 %
Incubation time: 10 d
86.000 %
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 1.53 kg/kg
ThOD : 1.68 kg/kg

Photodegradation : Rate constant: 1.28E-11 cm³/s
Method: Estimated.

LAURYL DIMETHYLAMINE OXIDE:

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

Bioaccumulative potential

Components:

2,4-D choline salt:

Partition coefficient: n-octanol/water : Remarks: For similar active ingredient(s).
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Glyphosate DMA Salt:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): < 1
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : Remarks: For similar active ingredient(s).
Glyphosate.
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Potential for mobility in soil is slight (Koc between 2000 and 5000).

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

Propylene glycol:

Bioaccumulation : Bioconcentration factor (BCF): 0.09
Method: Estimated.

Partition coefficient: n-octanol/water : log Pow: -1.07
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

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LAURYL DIMETHYLAMINE OXIDE:

Partition coefficient: n-octanol/water :

Remarks: Relevant data not available.

Balance:

Partition coefficient: n-octanol/water :

Remarks: No relevant data found.

Mobility in soil

Components:

2,4-D choline salt:

Distribution among environmental compartments :

Koc: 20 - 136
Method: Measured
Remarks: For similar active ingredient(s).
Potential for mobility in soil is high (Koc between 50 and 150).

Glyphosate DMA Salt:

Distribution among environmental compartments :

Remarks: For similar active ingredient(s).
Glyphosate.
Expected to be relatively immobile in soil (Koc > 5000).

Propylene glycol:

Distribution among environmental compartments :

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

LAURYL DIMETHYLAMINE OXIDE:

Distribution among environmental compartments :

Remarks: No relevant data found.

Balance:

Distribution among environmental compartments :

Remarks: No relevant data found.

Other adverse effects

Product:

Results of PBT and vPvB assessment :

This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

Components:

2,4-D choline salt:

Results of PBT and vPvB :

This substance is not considered to be persistent, bioaccumu-

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assessment lating 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.

Glyphosate DMA Salt:

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.

Propylene glycol:

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.

LAURYL DIMETHYLAMINE OXIDE:

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.

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If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION**International Regulations****UNRTDG**

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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**

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (2,4-D Salt)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
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.

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 : Respiratory or skin sensitization

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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US State Regulations

Pennsylvania Right To Know

Propylene glycol 57-55-6
formaldehyde 50-00-0

California Prop. 65

WARNING: This product can expose you to chemicals including formaldehyde, which is/are known to the State of California to cause cancer. 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

No substances are subject to a Significant New Use Rule.

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

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-649

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

Causes substantial but temporary eye injury
Harmful if swallowed
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

Dow IHG : Dow Industrial Hygiene Guideline
US WEEL : USA. Workplace Environmental Exposure Levels (WEEL)
Dow IHG / TWA : Time Weighted Average (TWA):
US WEEL / TWA : 8-hr TWA

AiIC - 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

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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

Revision Date : 01/19/2022

Product code: GF-2726

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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