SAFETY DATA SHEET

Vertisan®

Version	Revision Date:	SDS Number:	Date of last issue: 03/01/2022
1.1	03/01/2022	800080000419	Date of first issue: 03/01/2022

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 : Vertisan®

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).

800-992-5994 or 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : Fungicide

Restrictions on use : Do not use product for anything outside of the above specified uses.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 4

Eye irritation : Category 2A

Skin sensitization : Category 1

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H227 Combustible liquid.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

Precautionary Statements :

Prevention:

P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: 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 + P235 Store in a well-ventilated place. Keep cool.

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)
penthiopyrad (ISO)	183675-82-3	20.4
Ethoxylated Isodecyl Alcohol	78330-20-8	>= 20 - < 25

N,N-Dimethyloctanamide	1118-92-9	>= 10 - < 20
N,N-Dimethyldecan-1-amide	14433-76-2	>= 10 - < 20
methanol	67-56-1	>= 0.1 - < 0.3
Balance	Not Assigned	> 10

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Never give anything by mouth to an unconscious person.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
For medical emergencies involving this product, call toll free 1-888-226-8832. See Label for Additional Precautions and Directions for Use.
Information presented in Section 4 conforms to the requirements of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard of 2012. See Section 15 for applicable information conforming to the requirements of the Federal Insecticide Fungicide and Rodenticide Act (FIFRA), as required by the US Environmental Protection Agency (EPA), or by state Regulatory Agencies.

If inhaled : Move to fresh air.
If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.
Call a poison control center or doctor for treatment advice.

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

In case of eye contact : Hold eye 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 eye.
Call a poison control center or doctor for treatment advice.

If swallowed : Call a poison control center or doctor for treatment advice.
Have person sip a glass of water if able to swallow.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : No cases of human intoxication are known and the symptoms of experimental intoxication are not known.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

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

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

Specific hazards during 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 firefighting 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.
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	:	Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Do not use a solid water stream as it may scatter and spread fire. Use a water spray to cool fully closed containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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

For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped,
Recovered material should be stored in a vented container. The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to overpressurization of the container.
Keep in suitable, closed containers for disposal.
Wipe up with absorbent material (e.g. cloth, fleece).
Non-sparking tools should be used.
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Suppress (knock down) gases/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	:	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. Avoid inhalation of vapor or 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 : 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
methanol	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m3	OSHA Z-1

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
methanol	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI

Engineering measures : When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

Personal protective equipment

Respiratory protection : Where there is potential for airborne exposures in excess of applicable limits, wear approved respiratory protection with dust/mist cartridge.

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 safety glasses (with side shields).
Skin and body protection	:	Personal protective equipment required for early entry: Coveralls Shoes plus socks Chemical resistant gloves made of any waterproof material Protective eyewear Goggles, face shield, or safety glasses. Mixers, loaders, applicators and other handlers must wear: Long sleeved shirt and long pants Shoes plus socks Protective eyewear Goggles, face shield, or safety glasses.
Protective measures	:	Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. Use this product in accordance with its label.
Hygiene measures	:	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/PPE immediately if material gets inside. Wash thoroughly and put on clean clothing. Remove personal protective equipment immediately after handling this product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	light yellow
Odor	:	fruity
Odor Threshold	:	not determined
pH	:	5.8 Concentration: 10 g/L
Melting point/range	:	Not applicable
Freezing point		No data available
Boiling point/boiling range	:	No data available
Flash point	:	190 °F / 88 °C Method: Pensky-Martens closed cup, 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	:	0.9681
Density	:	No data available
Solubility(ies)		
Water solubility	:	emulsifiable
Autoignition temperature	:	482 °F / 250 °C
Viscosity		
Viscosity, dynamic	:	100 - 500 mPa.s
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

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. Vapors may form explosive mixture with air. May form explosive dust-air mixture.
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	None.
Hazardous decomposition products	:	Decomposition products depend upon temperature, air supply and the presence of other materials.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): > 5,000 mg/kg Method: OECD Test Guideline 425 Symptoms: No deaths occurred at this concentration.

Acute inhalation toxicity : LC50 (Rat, male and female): > 4.89 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Symptoms: No deaths occurred at this concentration., Rapid respiration
Assessment: The component/mixture is minimally toxic after short term inhalation.
Remarks: Maximum attainable concentration.

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:

penthiopyrad (ISO):

Acute oral toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 423
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): > 5.59 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

Ethoxylated Isodecyl Alcohol:

Acute oral toxicity : LD50 (Rat): > 500 - 2,000 mg/kg
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rat): > 4,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

N,N-Dimethyloctanamide:

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

Acute inhalation toxicity : LC50 (Rat, male and female): > 3.551 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: For similar material(s):

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

Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

N,N-Dimethyldecan-1-amide:

Acute oral toxicity : LD50 (Rat, male and female): > 2,000 - 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 3.551 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Maximum attainable concentration.

Acute dermal toxicity : LD50 (Rat): > 2,000 - 5,000 mg/kg

methanol:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Assessment: The component/mixture is toxic after single ingestion.
Remarks: Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.
Effects may be delayed.

Lethal Dose (Humans): 340 mg/kg
Method: Estimated.

Lethal Dose (Humans): 29 - 237 ml
Method: Estimated.

Acute inhalation toxicity : Remarks: Easily attainable vapor concentrations may cause serious adverse effects, even death.
At lower concentrations:
May cause respiratory irritation and central nervous system depression.
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.
Inhalation of methanol may cause effects ranging from headache, narcosis and visual impairment to metabolic acidosis, blindness, and even death.
Effects may be delayed.

LC50 (Rat): 3 mg/l
Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rabbit): 15,800 mg/kg
Assessment: The component/mixture is toxic after single contact with skin.
Remarks: Effects of methanol are the same as observed via oral and inhalation exposure and include central nervous system (CNS) depression, visual impairment up to blindness,

metabolic acidosis, with effects on organ systems such as liver, kidneys and heart, even death.

Skin corrosion/irritation

Product:

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

Components:

penthiopyrad (ISO):

Species	:	Rabbit
Exposure time	:	72 h
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

N,N-Dimethyloctanamide:

Result	:	Skin irritation

N,N-Dimethyldecan-1-amide:

Result	:	Skin irritation

methanol:

Result	:	No skin irritation

Serious eye damage/eye irritation

Product:

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

Components:

penthiopyrad (ISO):

Species	:	Rabbit
Result	:	No eye irritation
Exposure time	:	72 h
Method	:	OECD Test Guideline 405

Ethoxylated Isodecyl Alcohol:

Result	:	Corrosive

N,N-Dimethyloctanamide:

Result	:	Corrosive

N,N-Dimethyldecan-1-amide:

Result : Eye irritation

methanol:

Result : No eye irritation

Respiratory or skin sensitization

Product:

Test Type : Local lymph node test
Species : Mouse
Assessment : May cause sensitization by skin contact.
Method : OECD Test Guideline 429

Components:

penthiopyrad (ISO):

Test Type : Maximization Test
Species : Guinea pig
Assessment : Does not cause skin sensitization.
Method : OECD Test Guideline 406

Ethoxylated Isodecyl Alcohol:

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

Remarks : For respiratory sensitization:
No relevant data found.

N,N-Dimethyloctanamide:

Remarks : For similar material(s):
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

N,N-Dimethyldecan-1-amide:

Assessment : Does not cause skin sensitization.
Remarks : For similar material(s):
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

Germ cell mutagenicity

Components:

penthiopyrad (ISO):

Germ cell mutagenicity - Assessment : In vivo tests did not show mutagenic effects, In vitro genetic toxicity studies were negative.

Ethoxylated Isodecyl Alcohol:

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

N,N-Dimethyloctanamide:

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

N,N-Dimethyldecan-1-amide:

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

methanol:

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

Carcinogenicity

Components:

penthiopyrad (ISO):

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

N,N-Dimethyloctanamide:

Carcinogenicity - Assessment : Similar material(s) did not cause cancer in laboratory animals.

methanol:

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:

penthiopyrad (ISO):

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

sessment | Did not cause birth defects or any other fetal effects in laboratory animals.

N,N-Dimethyloctanamide:

Reproductive toxicity - Assessment : No relevant data found.
For similar material(s):, Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

N,N-Dimethyldecan-1-amide:

Reproductive toxicity - Assessment : For similar material(s):, Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Did not cause birth defects in laboratory animals.

methanol:

Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction.
Methanol has caused birth defects in mice at doses nontoxic to the mother as well as slight behavioral effects in offspring of rats.

STOT-single exposure

Product:

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

Components:

penthiopyrad (ISO):

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

Ethoxylated Isodecyl Alcohol:

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

N,N-Dimethyloctanamide:

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

N,N-Dimethyldecan-1-amide:

Assessment : May cause respiratory irritation.

methanol:

Target Organs : Eyes, Central nervous system
Assessment : Causes damage to organs.

Repeated dose toxicity

Components:

penthiopyrad (ISO):

Species	:	multiple species
Application Route	:	Oral
Method	:	OECD Test Guideline 407
Remarks	:	In animals, effects have been reported on the following organs: Reduced body weight gain Liver effects Thyroid effects Spleen effects Gallbladder effects Liver enlargement immune system effects altered blood chemistry altered hematology Organ weight changes Decreased spleen weight Increased liver weight

Ethoxylated Isodecyl Alcohol:

Remarks	:	No relevant data found.

N,N-Dimethyloctanamide:

Remarks	:	Based on information for a similar material: In animals, effects have been reported on the following organs: Kidney. Eye.

N,N-Dimethyldecan-1-amide:

Remarks	:	For similar material(s): In animals, effects have been reported on the following organs: Eye. Liver. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

methanol:

Remarks	:	Methanol is highly toxic to humans and may cause central nervous system effects, visual disturbances up to blindness, metabolic acidosis, and degenerative damage to other organs including liver, kidney, and heart.

Aspiration toxicity

Product:

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

Components:

penthiopyrad (ISO):
Based on physical properties, not likely to be an aspiration hazard.

Ethoxylated Isodecyl Alcohol:
No aspiration toxicity classification

N,N-Dimethyloctanamide:
Based on physical properties, not likely to be an aspiration hazard.

N,N-Dimethyldecan-1-amide:
Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia.

methanol:
May be harmful if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 0.32 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.2 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes

Components:

penthiopyrad (ISO):

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): 0.572 mg/l Exposure time: 96 h Test Type: flow-through Method: OECD Test Guideline 203 LC50 (Pimephales promelas (fathead minnow)): 0.290 mg/l Exposure time: 96 h Test Type: semi-static test Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1.375 mg/l Exposure time: 48 h Test Type: Static Method: OECD Test Guideline 202 LC50 (Americamysis bahia (mysid shrimp)): > 1.7 mg/l Exposure time: 96 h Test Type: Static Method: US EPA Test Guideline OPPTS 850.1035
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 4.0 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 0.45 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201 NOEC (Lemna gibba (gibbous duckweed)): 1.205 mg/l Exposure time: 7 d Test Type: Static Method: OECD Test Guideline 201 EbC50 (Pseudokirchneriella subcapitata (green algae)): 2.21 mg/l Exposure time: 72 h Test Type: Static Method: OECD Test Guideline 201 ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1.5 mg/l Exposure time: 96 h Test Type: Static Method: OECD Test Guideline 201 ErC50 (Lemna gibba (duckweed)): > 1.2 mg/l Exposure time: 7 d Test Type: Static Method: OECD Test Guideline 221
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.051 mg/l Exposure time: 33 d Test Type: Early Life-Stage Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.47 mg/l Exposure time: 21 d Test Type: flow-through test Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg Exposure time: 14 d Method: OECD Test Guideline 207
Toxicity to terrestrial organisms	:	LD50 (Colinus virginianus (Bobwhite quail)): > 2,250 mg/kg Method: US EPA Test Guideline OPPTS 850.2100 dietary LC50 (Colinus virginianus (Bobwhite quail)): > 1,913 mg/kg Exposure time: 5 d Method: OECD Test Guideline 205 oral LD50 (Apis mellifera (bees)): > 500 µg/b Exposure time: 48 d Method: OECD Test Guideline 213 contact LD50 (Apis mellifera (bees)): > 500 µg/b Exposure time: 48 d Method: OECD Test Guideline 214

Ethoxylated Isodecyl 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 (Leuciscus idus (Golden orfe)): > 1 - 10 mg/l Exposure time: 96 h Remarks: For similar material(s):
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Other): > 1 - 10 mg/l Exposure time: 48 h Remarks: For similar material(s):
Toxicity to algae/aquatic plants	:	EC50 (Algae): > 1 - 10 mg/l Exposure time: 72 h Remarks: For similar material(s):

N,N-Dimethyloctanamide:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 14.8 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 7.7 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 16.06 mg/l Exposure time: 72 h

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

N,N-Dimethyldecan-1-amide:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 14.8 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 7.7 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 16.06 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.079 mg/l
Exposure time: 21 d

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

methanol:

Toxicity to fish : Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50 (Oncorhynchus mykiss (rainbow trout)): 19,000 mg/l
Exposure time: 96 h
Method: Method Not Specified.

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 48 h
Method: Method Not Specified.

Toxicity to microorganisms : IC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h

Persistence and degradability

Components:

penthiopyrad (ISO):

Biodegradability : Result: Not readily biodegradable.
Method: OECD Test Guideline 301F or Equivalent

Ethoxylated Isodecyl Alcohol:

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

Biodegradation: > 60 %
Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent
Remarks: For similar material(s):

N,N-Dimethyloctanamide:

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

Result: Readily biodegradable.
Biodegradation: > 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
Remarks: 10-day Window: Pass

Chemical Oxygen Demand (COD) : 2.890 kg/kg

ThOD : 2.85 kg/kg

N,N-Dimethyldecan-1-amide:

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

Result: Readily biodegradable.
Biodegradation: 66.12 %
Exposure time: 11 d
Method: OECD Test Guideline 301B or Equivalent
Remarks: 10-day Window: Pass

methanol:

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

Biochemical Oxygen Demand (BOD) : 72 %
Incubation time: 5 d

79 %
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 1.49 kg/kg
Method: Dichromate

ThOD : 1.50 kg/kg

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Concentration: 1,500,000 1/cm3
Rate constant: 6.16E-13 cm3/s
Method: Estimated.

Bioaccumulative potential

Components:

penthiopyrad (ISO):

Bioaccumulation	:	Species: Oncorhynchus mykiss (rainbow trout) Bioconcentration factor (BCF): 155 - 186 Exposure time: 14 d Method: OECD Test Guideline 305
Partition coefficient: n-octanol/water	:	log Pow: 3.2 (75 °F / 24 °C)

Ethoxylated Isodecyl Alcohol:

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

N,N-Dimethyloctanamide:

Partition coefficient: n-octanol/water	:	log Pow: 2.59 (73 °F / 23 °C) Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

N,N-Dimethyldecan-1-amide:

Partition coefficient: n-octanol/water	:	log Pow: 3.44 Method: Estimated. Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

methanol:

Bioaccumulation	:	Species: Leuciscus idus (Golden orfe) Bioconcentration factor (BCF): < 10 Method: Measured
Partition coefficient: n-octanol/water	:	log Pow: -0.77 Method: Measured Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Balance:

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

Mobility in soil

Product:

Distribution among environmental compartments	:	Remarks: Slightly mobile in soils

Components:

penthiopyrad (ISO):

Distribution among environmental compartments : Remarks: Under actual use conditions the product has a low potential of mobility in soil.

Ethoxylated Isodecyl Alcohol:

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

N,N-Dimethyloctanamide:

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

N,N-Dimethyldecan-1-amide:

Distribution among environmental compartments : Koc: 351 - 630
Remarks: Potential for mobility in soil is medium (Koc between 150 and 500).

methanol:

Distribution among environmental compartments : Koc: 0.44
Method: Estimated.
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Balance:

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

Other adverse effects

Product:

Additional ecological information : Environmental Hazards:
This product is toxic to fish.
For Terrestrial Uses:
Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark.
Do not contaminate water when cleaning equipment or disposing of equipment wash waters or rinsate.
Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.
See product label for additional application instructions relating to environmental precautions.

Components:

penthiopyrad (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).

Ethoxylated Isodecyl 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.

N,N-Dimethyloctanamide:

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.

N,N-Dimethyldecan-1-amide:

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.

methanol:

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.

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 identifica-

tion 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. (Penthiopyrad)
Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Penthiopyrad)
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. (Penthiopyrad)
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.

Domestic regulation

49 CFR

UN/ID/NA number	:	NA 1993
Proper shipping name	:	Combustible liquid, n.o.s. (Methanol)
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.
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)
Respiratory or skin sensitization
Serious eye damage or eye irritation

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.

California Prop. 65

WARNING: This product can expose you to chemicals including methanol, 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

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 : 352-836

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:

CAUTION

Causes moderate eye irritation.
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.
May be harmful if swallowed.

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)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average

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 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 : 03/01/2022

Product code: GF-4206

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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