



TEXAS A&M
FOREST SERVICE



Image by Kyle Cunningham

SAFETY DATA SHEETS

for Forestry-Labeled Herbicides

April 2019

How to Use this Reference Manual

This reference document provides Material Safety Data Sheets (MSDS) for most herbicide brands labeled for forestry use by the brand's herbicide chemical(s). If we were to provide the Material Safety Data Sheets (MSDS) for each of the herbicide brands labeled for forestry use, this document would be overly burdensome. **For this reason, this reference manual lists one and only one MSDS for each of the herbicide chemicals.** The safety requirements will be similar enough for a specific chemical derivative (e.g., acid, amine, ester, choline, etc.). If the safety requirements differ by chemical derivative then additional MSDS sheets are provided for those derivatives. For example the amine derivative of triclopyr has additional safety concerns beyond that of the ester or choline derivative of triclopyr. As such two MSDS are provided.

Steps

1. Locate the Brand Name(s) in the table of contents and determine the corresponding herbicide chemical and page number.

Example: Polaris AC includes the herbicide imazapyr listed on page 101

2. Turn to the appropriate page and review the basic information about the herbicide chemical including
 - a. target plant groups
 - b. resistant plant groups
 - c. brand characteristics
 - d. special notes
 - e. signal word and
 - f. use statement.

3. Turn to the next page to read a representative MSDS for all brands using that herbicide chemical(s) and derivative.

Example: Page 102 provide MSDS for Arsenal AC which representative of Polaris AC and other brands.

4. Read the safety requirements thoroughly and review important first-aid measures.

Globally Harmonized System (GHS) Hazard Pictograms



Explosive

- Explosive
- Self-reactive
- Organic Peroxides



Compressed Gas

- Gases Under Pressure



Harmful

- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity (harmful)
- Narcotic effects
- Respiratory Tract Irritant
- Hazardous to Ozone



Flammable

- Flammables
- Pyrophoric
- Self-heating
- Emits Flammable Gas
- Self-reactive
- Organic Peroxides



Corrosive

- Skin Corrosion / Burns
- Eye Damage
- Corrosive to Metals



Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity



Oxidizing

- Oxidizers



Toxic

- Acute Toxicity (fatal or toxic)



Environmental Hazard

- Acute Toxicity (fatal or toxic)

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Brand Name	Active Ingredient(s)	Page Number
Accord XRT II	glyphosate	75
Arrow 2EC	clethodim	33
Arsenal AC	imazapyr	101
Atrazine 4L	atrazine	24
Atrazine 90DF	atrazine	24
Boulder 63	triclopyr	219
Brush-Rhap	dicamba & 2,4-D	262
Capstone	aminopyralid & triclopyr	249
Chopper Gen2	imazapyr	101
Clean Slate	clopyralid	40
Cleantraxx	oxyfluorfen & penoxsulam	300
Clearcast	imazamox	113
Clethodim 2E	clethodim	33
Clopyralid 3	clopyralid	40
Dakota	clethodim	33
Detail	saflufenacil	185
Element 3A	triclopyr	209
Element 4	triclopyr	219
Envoy Plus	clethodim	33
Escort XP	metsulfuron methyl	130
Esplanade F	indaziflam	118
Foresters	glyphosate	75
Formula 40	2,4-D	5
Freelexx	2,4-D	5
Fusilade DX	fluazifop-p-butyl	61
Fusilade II	fluazifop-p-butyl	61
Garlon 3A	triclopyr	209
Garlon 4 Ultra	triclopyr	219
Garlon XRT	triclopyr	219
Glyphosate 54	glyphosate	75
Goal 2XL	oxyfluorfen	141
Graslan L	picloram & 2,4-D	314
Imazapyr 2SL	imazapyr	101
Imazapyr 4SL	imazapyr	101
Intensity 1	clethodim	33
Krenite S	fosamine	70

Lineage Clearstand	imazapyr & metsulfuron methyl	289
Mad Dog 54	glyphosate	75
Mad Dog Plus	glyphosate	75
Makaze	glyphosate	75
Milestone	aminopyralid	13
Milestone VM Plus	aminopyralid & triclopyr	249
MSM 60DF	metsulfuron methyl	130
Opensight	aminopyralid & metsulfuron methyl	236
Oust Extra	sulfometuron methyl & metsulfuron methyl	330
Oust XP	sulfometuron methyl	199
Oustart	hexazinone & sulfometuron methyl	270
Pathfinder II	triclopyr	219
Pathway	picloram & 2,4-D	314
Patriot	metsulfuron methyl	130
Picloram 22K	picloram	161
Picloram Plus D	picloram & 2,4-D	314
Polaris AC	imazapyr	101
Polaris SP	imazapyr	101
Prep-It	imazapyr & glyphosate	282
Pronone	hexazinone	87
Razor	glyphosate	75
Razor Pro	glyphosate	75
Relegate RTU	triclopyr	219
Rodeo	glyphosate	75
Rotary 2SL	imazapyr	101
Roundup Custom	glyphosate	75
Roundup Pro Concentrate	glyphosate	75
Roundup ProMax	glyphosate	75
Select 2EC,	clethodim	33
Select Max	clethodim	33
SFM 75	sulfometuron methyl	199
SFM Extra	sulfometuron methyl & metsulfuron methyl	330
Spitfire	dicamba & 2,4-D	262
Spyder	sulfometuron methyl	199
Spyder Extra	sulfometuron methyl & metsulfuron methyl	330
Sterling Blue	dicamba	54
Stinger	clopyralid	40
Tahoe 3A	triclopyr	209
Tordon 101	picloram & 2,4-D	314

Tordon 22K	picloram	161
Transline	clopyralid	40
Triclopyr 3	triclopyr	209
Triclopyr 4	triclopyr	219
Triclopyr RTU	triclopyr	219
Trooper P+D	picloram & 2,4-D	314
Vanquish	dicamba	54
Vastlan	triclopyr	209
Velossa	hexazinone	87
Velpar DF	hexazinone	87
Velpar L	hexazinone	87
Weberan 720	dicamba & 2,4-D	262
Weedmaster	dicamba & 2,4-D	262
Weedone	2,4-D	5

2,4-D

Target Plants: Many annual and perennial broadleaf weeds, vines, and some woody plants when actively growing.

Resistant Plants: Red maple, ash, elm, persimmon, some oaks/hickories, blackberry. No impact to grasses. Can be applied over conifers once hardened off.

Brands: 2,4-D Amine, Freelexx, Weedone, Formula 40

Signal Word: **DANGER**
(on at least one product)

Use Statement: General Use



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Formula 40**

EPA Reg. No.: 228-357

Product Type: Herbicide

Company Name: Nufarm Americas Inc
11901 S. Austin Avenue
Alsip, IL 60803
1-800-345-3330

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:

Flammable Liquid Category 4

HEALTH HAZARDS:

Acute Toxicity Oral Category 4

Eye Damage Category 1

Skin Irritation Category 2

Skin Sensitization Category 1

ENVIRONMENTAL HAZARDS:

Hazardous to aquatic environment, acute Category 2

Hazardous to aquatic environment, chronic Category 3

SIGNAL WORD:

DANGER

HAZARD STATEMENTS:

Combustible liquid. Harmful if swallowed. Causes serious eye damage. Causes skin irritation. May cause an allergic skin reaction. Toxic to aquatic life. Harmful to aquatic life with long lasting effects.



PRECAUTIONARY STATEMENTS

Keep away from flames and hot surfaces. No smoking. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid breathing mist, vapors, or spray. Wear protective gloves and eye protection. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment.

IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth.

In case of fire: Use dry chemical or carbon dioxide.

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.

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IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice. Take off contaminated clothing and wash it before reuse.

Collect spillage.

Store in a well-ventilated place. Keep cool.

Dispose of contents in accordance with local, state, and federal regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid	2008-39-1	21.3 – 22.7
Triisopropanolamine Salt of 2,4-Dichlorophenoxyacetic Acid	32341-80-3	33 – 35
Other Ingredients	Trade Secret	Trade Secret

Synonyms: Mixture containing 2,4-D TIPA and 2,4-D DMA salts; Triisopropanolamine Salt and Dimethylamine Salt of 2,4-Dichlorophenoxyacetic acid

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get immediate medical attention.

If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for several minutes. If irritation or rash occurs, get medical advice.

If Swallowed: 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. Do not give anything by mouth to an unconscious person. If symptoms develop, get medical advice.

If Inhaled: Move person to fresh air. If breathing is difficult, administer oxygen. If symptoms develop, get medical advice.

Most important symptoms/effects, acute and delayed: Causes severe eye irritation with possible eye damage. Causes skin irritation. May be harmful if swallowed. Causes allergic skin reaction (sensitization).

Indication of immediate medical attention and special treatment needed, if necessary: Get immediate medical attention for eye contact. For ingestion there is no specific antidote available. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

HANDLING:

Keep out of reach of children. Causes eye damage and skin irritation. Harmful if swallowed. May cause allergic reaction in susceptible individuals. Avoid contact with eyes, skin and clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

STORAGE:

Do not store below temperature of 40°F (7°C). If frozen (crystallized), warm to 80-90°F (27-32°C) and redissolve before using by rolling or shaking the container. Store in a safe manner. Store in cool, dry place in original container only. Keep container tightly closed when not in use. Reduce stacking height where local condition can affect packaging strength. See product label for handling/storage precautions relative to the end use of this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Eye/Face Protection: To avoid contact with eyes, wear face shield or goggles. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
TIPA Salt of 2,4-D	10*	NE	10*	NE	mg/m ³
DMA Salt of 2,4-D	10*	NE	10*	NE	mg/m ³
Other Ingredients	NE	NE	NE	NE	

*Based on adopted limit for 2,4-D

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Translucent amber liquid
Odor:	Phenolic-like
Odor threshold:	Not determined
pH:	Not determined
Melting point/freezing point:	Not determined
Initial boiling point and boiling range	Not determined
Flash point:	191 °F (88° C) TCC
Evaporation rate:	Not determined
Flammability (solid, gas):	Not determined
Upper/lower flammability or explosive limits:	Not applicable
Vapor pressure:	Not determined
Vapor density:	Not determined
Relative density:	1.18 – 1.25
Solubility(ies):	(water) infinite
Partition coefficient: n-octanol/water:	Not determined
Autoignition temperature:	No data available
Decomposition temperature:	No data available

Viscosity: Not determined

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: This product is not normally reactive.

Chemical Stability: This material is stable under normal handling and storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Excessive heat. Do not store near heat or flame. Avoid temperatures near or above flash point.

Incompatible Materials: Strong oxidizing agents: bases and acids.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, eye and skin contact.

Symptoms of Exposure:

Eye Contact: May cause severe irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin Contact: Slightly irritating to the skin. Skin contact may cause allergic reaction. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Ingestion: Harmful if swallowed. May cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms.

Inhalation: May be harmful if inhaled. May cause upper respiratory tract irritation and symptoms similar to those from ingestion.

Delayed, immediate and chronic effects of exposure: None reported.

Toxicology Data

Data from laboratory studies conducted on a similar, but not identical, formulation:

Oral: Rat LD₅₀: 866 mg/kg (males); 1058 mg/kg (females)

Dermal: Rat LD₅₀: >2,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >8.2 mg/L

Eye Irritation: Rabbits: Severely irritating/corrosive

Skin Irritation: Rabbits: Slightly irritating

Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods.

Carcinogenicity / Chronic Health Effects: Prolonged overexposure can cause liver, kidney and muscle damage. The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic potential. The U.S. EPA has given 2,4-D a Class D classification (not classifiable as to human carcinogenicity).

Reproductive Toxicity: No impairment of reproductive function attributable to 2,4-D has been noted in laboratory animal studies.

Developmental Toxicity: Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that 2,4-D is not mutagenic.

ASSESSMENT CARCINOGENICITY:

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

Regulatory Agency Listing As Carcinogen
--

Component	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides (2,4-D salts)	No	2B	No	No
Other Ingredients	No	No	No	No

IARC Group 2B: Possibly carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on TIPA Salt of 2,4-D Acid:

Bluegill Acute LC ₅₀ :	432 mg/l	Pink Shrimp Acute LC ₅₀ :	744 mg/l
Rainbow Trout Acute LC ₅₀ :	317 mg/l	Tidewater Silverside Acute LC ₅₀ :	376 mg/l
Daphnia Acute LC ₅₀ :	748 mg/l	Growth Inhibition EC ₅₀ Green Algae:	103 mg/l

Data on 2,4-D, Dimethylamine Salt:

96-hour LC ₅₀ Bluegill:	524 mg/l	Bobwhite Quail Oral LD ₅₀ :	500 mg/kg
96-hour LC ₅₀ Rainbow Trout:	250 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>5,620 ppm
48-hour EC ₅₀ Daphnia:	184 mg/l		

Environmental Fate:

In laboratory and field studies, 2,4-D salts rapidly dissociate to parent acid in the environment. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticide wastes are toxic. If container is damaged or if pesticide has leaked, contain all spillage. Place in a closed, labeled container for proper disposal. Improper disposal of excess pesticide, spray mixtures, or rinsate is a violation of Federal law and may contaminate groundwater. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA regional office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. If recycling or reconditioning not available, puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT

< 17 gallons per complete package

Non Regulated

≥ 17 gallons per complete package

UN 3082, Environmentally hazardous substances, liquid, n.o.s. (2,4-D Salts), 9, III, RQ,

IMDG

Non Regulated

IATA

Non Regulated

15. REGULATORY INFORMATION**EPA FIFRA INFORMATION**

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

DANGER. Corrosive. Causes irreversible eye damage. May be fatal if absorbed through skin. Harmful if swallowed. Do not get in eyes, on skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Acute Health, Fire Hazard

Section 313 Toxic Chemical(s):

None

Reportable Quantity (RQ) under U.S. CERCLA:

None

RCRA Waste Code:

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not listed

16. OTHER INFORMATION**National Fire Protection Association (NFPA) Hazard Rating:**

Rating for this product: Health: 3 Flammability: 2 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and

SAFETY DATA SHEET

Formula 40

others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: May 10, 2015

Supersedes: October 11, 2013

aminopyralid

Target Plants: Many annual, biennial, and perennial broadleaf weeds including thistle spp., ragweed, marestail, as well as woody plants in the legume family such as mimosa, redbud, and locust spp. Kudzu, Wisteria, and Japanese Stiltgrass.

Resistant Plants: Many woody plants. Highest efficacy as a tank mix partner. Dogfennel, wild carrot, plaintain, goldenrod, vervain, broom snakeweed, toadflax.

Brands: Milestone

Signal Word: **CAUTION**

Use Statement: General Use

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: MILESTONE™ Herbicide

Issue Date: 05/26/2015

Print Date: 05/26/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: MILESTONE™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Aminopyralid Triisopropanolamine Salt	566191-89-7	40.6%

Triisopropanolamine	122-20-3	1.5%
Balance	Not available	57.9%

4. FIRST AID MEASURES

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

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

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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

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

Advice for firefighters

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

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

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

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

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

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Triisopropanolamine	Dow IHG	TWA	10 mg/m ³

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

Exposure controls

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

Individual protection measures

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

Skin protection

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Other protection: No precautions other than clean body-covering clothing should be needed.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Brown
Odor	Mild
Odor Threshold	no data available
pH	7.3 <i>pH Electrode</i>
Melting point/range	Not applicable
Freezing point	< -10 °C (< 14 °F)
Boiling point (760 mmHg)	no data available
Flash point	closed cup > 100 °C (> 212 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	no data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapor Pressure	no data available
Relative Vapor Density (air = 1)	no data available
Relative Density (water = 1)	1.14 at 20 °C (68 °F)
Water solubility	Soluble
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	none below 400 degC
Decomposition temperature	No test data available
Dynamic Viscosity	12.2 cP at 20 °C (68 °F) <i>EPA OPPTS 830.7100 (Viscosity)</i>
Kinematic Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	no data available

Liquid Density	1.140 g/cm ³ at 20 °C (68 °F) <i>Digital density meter</i>
Molecular weight	no data available
Surface tension	54.4 mN/m at 20 °C (68 °F)

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

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

Incompatible materials: Avoid contact with: Strong oxidizers.

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

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

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

As product:

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

Acute dermal toxicity

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

As product:

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

Acute inhalation toxicity

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

As product:

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.79 mg/l

Skin corrosion/irritation

Essentially nonirritating to skin.

Serious eye damage/eye irritation

Essentially nonirritating to eyes.
Corneal injury is unlikely.

Sensitization

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

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

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

Carcinogenicity

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

Teratogenicity

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

Reproductive toxicity

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

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Toxicity**Acute toxicity to fish**

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), static test, 96 Hour, 360 mg/l, OECD Test
Guideline 203 or Equivalent

LC50, *Cyprinodon variegatus* (sheepshead minnow), static test, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), static test, 48 Hour, > 460 mg/l

LC50, saltwater mysid *Mysidopsis bahia*, static test, 96 Hour, > 104 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, > 1,000 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

dietary LC50, Colinus virginianus (Bobwhite quail), > 21422mg/kg diet.

oral LD50, Colinus virginianus (Bobwhite quail), > 10,000 ppm

oral LD50, Apis mellifera (bees), > 460micrograms/bee

contact LD50, Apis mellifera (bees), > 460micrograms/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, survival, > 10,000 mg/kg

Persistence and degradability

Aminopyralid Triisopropanolamine Salt

Biodegradability: For similar material(s): Aminopyralid. Material is not readily biodegradable according to OECD/EEC guidelines.

Triisopropanolamine

Biodegradability: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Biodegradation rate may increase in soil and/or water with acclimation. Material is not readily biodegradable according to OECD/EEC guidelines.

10-day Window: Fail

Biodegradation: 0 %

Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 2.35 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 3 Hour

Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Aminopyralid Triisopropanolamine Salt

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

Triisopropanolamine

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

Partition coefficient: n-octanol/water(log Pow): -0.015 at 23 °C Measured

Bioconcentration factor (BCF): < 0.57 Fish. 42 d Measured

Balance

Bioaccumulation: No relevant data found.

Mobility in soil

Aminopyralid Triisopropanolamine Salt

For similar active ingredient(s).

Aminopyralid.

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

Triisopropanolamine

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

Partition coefficient(Koc): 10 Estimated.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

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

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

No SARA Hazards

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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 Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components	CASRN
Triisopropanolamine	122-20-3

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-519

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

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101209315 / A211 / Issue Date: 05/26/2015 / Version: 9.0

DAS Code: GF-871

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

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	Time Weighted Average (TWA):

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.

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

atrazine

Target Plants: Broad-spectrum broadleaf and grass control. Used as a preemergent or early post-emergent.

Resistant Plants: Minimally effective on established weeds.

Brands: Atrazine 4L, Atrazine 90DF

Signal Word: **CAUTION**

Use Statement: **RESTRICTED USE**
(on at least one product)



SAFETY DATA SHEET

DREXEL ATRAZINE 4L

Section 1: Material Identification

Product Name: Drexel Atrazine 4L

EPA Reg No.: 19713-11

CAS NO: 1912-24-9

Formula: C₈H₁₄ClN₅

Company: Drexel Chemical Company
1700 Channel Avenue
Memphis, TN 38106

Identifiers:

EINECS: 217-617-8

RTECS: XY5600000

DOT information: See Section 14 for Transportation Information

Emergency Telephone Number:

CHEMTREC	Drexel Chemical Co.
Tel: 1-800-424-9300	901-774-4370

This product is an EPA FIFRA registered pesticide. Some of the classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide. Please see **Section 15: REGULATORY INFORMATION** for explanation.

Section 2: Hazard Identification (As defined by the OSHA Hazard Communication Standard, 29)

GHS classification:

Health hazards:	Acute toxicity – inhalation	Category 4
	Specific target organ toxicity – repeated exposure	Category 2
Environmental hazards:	Aquatic acute toxicity	Category 2

GHS label elements:

Signal word: Warning



Hazard statements: Harmful if inhaled.
 May cause damage to heart through prolonged or repeated exposure.
 Toxic to aquatic life.

Precautionary statements:

Prevention: Avoid breathing vapors or spray. Use only outdoors or in well-ventilated area.
 Do not breathe dust/fume/gas/mist/vapors/spray.
 Prevent from entering into sewers, waterways and/or groundwater.
 See Section 12, Ecological Information.

Response: **If inhaled:** Remove person to fresh air and keep comfortable for breathing.
If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.
 Call a poison control center or doctor for further treatment advice.
 Get medical advice/attention if you feel unwell.

Storage: Store in a cool, dry, well ventilated and secure area designated specifically for pesticides and away from heat sources.
 Keep in original containers and keep containers closed when not in use.
 Do not store in excessive heat.
 Do not store near children, food, foodstuffs, drugs or potable water supplies.

Disposal: 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.

Section 3: Composition Information

<u>Components</u>	<u>CAS No.:</u>	<u>% By Wt.:</u>	<u>OSHA PEL:</u>	<u>ACGIH TLV:</u>
Active ingredients:				
Atrazine	1912-24-9	42.2%	N/A	5 mg/m ³
Related Triazines	N/A	0.8%	N/A	N/A
Inert ingredients:	N/A	57.0%	N/A	N/A

Section 4: First-Aid Measures

****Have the product container, label or Safety Data Sheet with you when calling poison control center or doctor or going for treatment.****

Eye Contact: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

If Swallowed: Call a poison control center or doctor immediately for treatment advice. Rinse mouth with water then 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. Do not give anything by mouth to an unconscious person. Have product label with you when calling a poison control center or doctor.

Skin Contact: Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated leather items such as shoes, belts, and watchbands.

If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Note to Physician: There is no specific antidote for Atrazine. If this product is ingested, induce emesis or lavage stomach. The use of an aqueous slurry of activated charcoal may be considered.

Section 5: Fire Fighting Measures

Fire Hazards: Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Thermal decomposition during a fire can produce fumes and irritating gases.

Flammability classification (OSHA 29 CFR 1910.1200): Non-combustible

Flash point: >200°F

Lower flammable limit (% by volume): N/A

Upper flammable limit (% by volume): N/A

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Evacuate the area and fight the fire from upwind at a safe distance to avoid hazardous vapors or decomposition products. Dike and collect fire-extinguishing water to prevent environmental damage and excessive waste runoff.

Firefighting media: Use foam, dry chemical, carbon dioxide, or water fog when fighting fires involving this product. Do not use water jet, as this may spread burning material. Minimize the use of water to avoid environmental contamination. Contain all runoff.

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

Hazardous Combustion Products: Carbon oxides, nitrogen oxides, halogenated compounds, irritating fumes and smoke

NFPA: Health: Flammability: Reactivity:

2

1

0

(Rating: 4-Extreme, 3-High, 2-Moderate, 1-Slight, 0-Insignificant)

Section 6: Accidental Release Measures

Steps to be taken if Material is Released or Spilled:

- Contain spilled material if possible. Small spills: absorb in earth, sand or absorbent material and sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Drexel Chemical Co. for clean-up assistance. See Section 13: Disposal Considerations, for additional information.

Personal Precautions:

- Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to Section 7: Handling and Storage, for additional precautionary measures. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8: Exposure Controls and Personal Protection.

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

Section 7: Handling and Storage

KEEP OUT OF REACH OF CHILDREN

Handling: **General Handling:** Avoid contact with eyes, skin, and clothing. When using do not eat, drink or smoke. Wash thoroughly after handling. Do not swallow. Avoid breathing vapor. Use with adequate ventilation. Wear coveralls, long-sleeved shirt and rubber boots when handling. Keep away from heat, sparks and flame. See Section 8: Exposure Controls and Personal Protection.

Storage: Store in a cool, dry, well ventilated and secure area designated specifically for pesticides and away from heat sources. Keep in original containers and keep containers closed when not in use. Do not store in excessive heat. Do not store near children, food, foodstuffs, drugs or potable water supplies.

Section 8: Exposure Controls / Personal Protection

Exposure Limits: TLV (Atrazine): 5 mg/m³

Personal Protection:

Eye/Face Protection: Wear safety glasses with side shields or chemical splash goggles to prevent vapors or mists from entering the eyes. If using a full face shield, always use safety glasses or goggles along with the face shield to ensure adequate protection of the eyes.

Skin 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. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

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

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. When handling in enclosed areas, when large quantities of mists are generated or prolonged exposure is possible in excess of the TLV, use a respirator with either an organic vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSG approval number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approval number prefixTC-14G).

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls:

Ventilation: When handling this product proper ventilation is required to maintain exposure below the TLV. Ventilate all transport vehicles prior to unloading. Facilities storing or utilizing this material should be equipped with and eyewash facility and safety shower.

Section 9: Physical and Chemical Properties

Physical State:	Liquid
Color:	White to off-white
Odor:	Slight
Flash Point:	N/A
Vapor Pressure (mmHg):	N/A
Boiling Point:	N/A
Vapor Density (air = 1):	N/A
Bulk Density (H₂O = 1):	1.11 g/cc
Freezing Point:	N/A
Solubility in water (wt. %) weight):	Miscible
pH:	4-8 (5% aqueous solution at 23°C)
Viscosity:	550-650 cP

Section 10: Stability and Reactivity

Stability/Instability: Stable at typical use temperatures and in closed containers.

Conditions to Avoid: Avoid heat of open flame. Avoid high temperatures above 130°F (54.4°C).

Incompatible Materials: Avoid contact with: Strong acids, Strong bases, Strong oxidizers

Hazardous Polymerization: Will not occur

Thermal Decomposition: Decomposition products can include and are not limited to: Carbon oxides, nitrogen oxides, ammonia and halogenated compounds.

Section 11: Toxicological Information

Acute Toxicity:

Ingestion (rat):

- Oral, LD50: >2,000 mg/kg

Dermal (rat):

- Dermal, LD50: >2,000 mg/kg

Inhalation (rat):

- Inhalation, LC50, Aerosol: >4.44 mg/l

Eye Irritation (rabbit):

- Non-irritating

Skin Irritation (rabbit):

- Non-irritating

Sensitization Skin (guinea pig):

- Non-sensitizer

Chronic Toxicity:

- Cardiotoxicity in long term study with high doses (dogs)

Carcinogenicity:

- Not likely to cause cancer in humans. None observed (male Sprague-Dawley rats, F-344 rats or mice).

Teratogenicity, mutagenicity, and other reproductive effects: None known

Section 12: Ecological Information

The information presented here is for the active ingredient, Atrazine:

ENVIRONMENTAL FATE:

- Slightly toxic to birds, aquatic invertebrates and bees

Persistence and Degradability:

- Low bioaccumulation potential. Not persistent in soil. Stable in water. Highly mobile in soil. Will leach. Sinks in water (after 24 hr.).

Aquatic Toxicity:

- Rainbow Trout, 96 hour, LC50: 4.5 ppm
- Bluegill, 96 hour, LC50: 54.5 ppm
- Daphnia magna, 48 hour, EC50: 6.9 ppm

Arthropod Toxicity:

- Bees, Acute, LD50: >25 µg/bee

Bird Toxicity:

- Bobwhite quail, 12 day, LD50: 940 mg/kg

Section 13: Disposal Considerations

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

Section 14: Transport Information

DOT Classification: Not regulated

IMDG/Water Transport: UN 3082, Environmentally hazardous Substance, Liquid, N.O.S. (Atrazine), 9, PG-III, Marine Pollutant

IATA/Air Transport: UN 3082, Environmentally hazardous Substance, Liquid, N.O.S. (Atrazine), 9, PG-III

Freight description: Agricultural herbicide, Liquid, n.o.s.

ERG Guide No.: 171

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

Section 15: Regulatory Information

OSHA Hazard Communication Standard:

- This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
- **EPA FIFRA INFORMATION:** This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemical. The hazard information required on the pesticide label is listed out below. The pesticide label also includes other important information, including directions for use.
- **EPA/CERCLA Reportable Quantity:** None known

SARA/TITLE III:

- **Sec. 302. Extremely Hazardous Substance Notification:** Not applicable
- **Sec. 311/312. Hazard Categories:** Acute health hazard
Chronic health hazard
- **Sec. 313. Toxic Chemical(s):** Atrazine (43.0%) (CAS No. 1912-24-9)

- **RCRA Waste Code:** Not applicable

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

- This product is not listed.

Toxic Substances Control Act (TSCA):

- All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

Section 16: Other Information

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

Date Revised: March 8, 2017

Supersedes: December 29, 2015

clethodim

Target Plants: Many annual and perennial grasses.

Resistant Plants: Little or no harm to broad-leaved plants.

Brands: Arrow 2EC, Envoy Plus, Intensity 1, Select Max, Select 2EC,
Dakota, Clethodim 2E

Signal Word: **CAUTION**

Use Statement: GENERAL USE

MATERIAL SAFETY DATA SHEET

ARROW® 2EC HERBICIDE

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1. IDENTIFICATION

Product name: **ARROW® 2EC HERBICIDE (EPA REG. NO. 66222-60)**
Chemical name of active ingredient(s): Clethodim: (E)-2-[1-[[[(3-chloro-2-propenyl)oxy]imino]propyl]- 5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
Manufacturer/Registrant: Makhteshim Agan of North America, Inc.
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604
Phone: 919-256-9300
For fire, spill, and/or leak emergencies, contact Infotrac: Phone: 1-800-535-5053
For medical emergencies and health and safety inquiries, contact Prosar: Phone: 1-877-250-9291

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	%	ACGIH/TLV	OSHA/PEL	OTHER	NTP/IARC/OSHA (Carcinogen)
Clethodim	99129-21-2	26.4	-	-	-	NA
Heavy aromatic petroleum hydrocarbons	64742-94-5	22.1	100 ppm 525 mg/m ³	-	-	NA
Contains Naphthalene (% of total)	91-20-3	2.2	10 ppm 52 mg/m ³	10 ppm 50 mg/m ³	-	NTP – 2* IARC – 2B**

* Substances which may reasonably be anticipated to be carcinogens.

** Substance is possibly carcinogenic to humans.

3. HAZARDS IDENTIFICATIONS

PHYSICAL PROPERTIES:

APPEARANCE: Amber liquid

ODOR: Mild aromatic

EMERGENCY OVERVIEW: CAUTION. Hazards to humans and domestic animals. Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing.

POTENTIAL HEALTH EFFECTS

Signs and Symptoms of Systemic Effects: Signs of toxicity in test animals exposed to lethal or near-lethal oral doses included lethargy, ataxia, irregular breathing, lacrimation and loose stools. This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of low viscosity products can cause chemical pneumonitis, which can be fatal. Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and, in infants, brain damage.

Eye: Based on an evaluation of the ingredients and/or similar products, this product is expected to cause prolonged and/or significant irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness, swelling and pain, which could last for an extended period of time.

Skin: Based on an evaluation of the ingredients and/or similar products, this product is expected to cause moderate skin irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness and swelling.

Based on an evaluation of the ingredients and/or similar products, this product may cause allergic skin reactions. In sensitized individuals even small exposures can trigger allergic reactions. The expected adverse health effects may include itching, redness, swelling and blistering of the skin.

Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when absorbed through the skin. The degree of injury will depend on the amount of material inhaled and the

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ARROW® 2EC HERBICIDE

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speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Ingestion: Based on an evaluation of the ingredients and/or similar products, this product is expected to be slightly toxic when ingested. The degree of injury will depend on the amount of material ingested and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above. Ingestion of this product may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause injury to the lungs and death.

Inhalation: Exposure to high concentrations may result in respiratory irritation. Signs and symptoms may include, but not be limited to, nasal discharge, sore throat, coughing and difficulty in breathing. Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when inhaled. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

PHYSICAL OR CHEMICAL HAZARDS: Do not use or store near heat or open flame.

4. FIRST AID

IF IN EYES:	<ul style="list-style-type: none">• 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 ON SKIN OR CLOTHING:	<ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15-20 minutes.• Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	<ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Do not give any liquid to the person.• Do not induce vomiting unless told to do so by a poison control center or doctor.• Do not give anything by mouth to an unconscious person.
IF INHALED:	<ul style="list-style-type: none">• Move person to fresh air.• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.• Call a poison control center or doctor for further treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-877-250-9291 for emergency medical treatment information.	
NOTE TO PHYSICIAN: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis. Contains petroleum distillate.	

5. FIRE FIGHTING MEASURES

FLASHPOINT: 64.83°C (149° F) (Pensky-Martens Closed Cup)

FLAMMABLE LIMITS (% in air): Not determined

AUTOIGNITION TEMPERATURE: Not determined

FIRE FIGHTING INSTRUCTIONS: Liquid evaporates and forms vapor (fumes), which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85°F. Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and firefighting equipment before reuse. Read the entire document.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

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6. ACCIDENTAL RELEASE MEASURES

FOR SPILLS ON LAND

CONTAINMENT: Avoid runoff into storm sewers and ditches which lead to waterways. Contain spilled liquids with dry sorbents.

CLEANUP: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then place in a chemical waste container. Wash the area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

FOR SPILLS IN WATER:

CONTAINMENT: This material forms an emulsion in water. Stop or reduce contamination of any water. Isolate contaminated water.

CLEANUP: Remove contaminated water for treatment or disposal.

7. HANDLING AND STORAGE

END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Do not contaminate water, food, or feed by storage or disposal or cleaning of equipment. Open dumping is prohibited.

PROHIBITIONS: Do not use or store near flame, sparks or hot surfaces. Use only in well ventilated area. Keep container closed. Do not contaminate water, food, or feed by storage or disposal, or cleaning of equipment. Open dumping is prohibited. Do not weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

STORAGE: Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Store in cool, dry place. Do not store diluted spray. Do not allow product to freeze. Store above 18° F (-8° C).

STORAGE TEMPERATURE (MIN/MAX):

Minimum: 18° F (-8°C)

Maximum: Normal ambient temperatures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, AND PACKAGING OF THE PRODUCT. FOR COMMERCIAL APPLICATION AND ON-FARM APPLICATIONS, CONSULT THE PRODUCT LABEL.

EYE PROTECTION: Appropriate eye protection must be worn when working with this material or serious harm can result. Wear protective eyewear.

RESPIRATORY/VENTILATION: This material may be a respiratory irritant and, unless ventilation is adequate, the use of approved respiratory protection is recommended. Use this material only in well-ventilated areas.

SKIN PROTECTION: Do not get on skin or clothing. Skin contact should be avoided by wearing protective clothing including chemical resistant gloves (such as barrier laminate or Viton ≥ 14 mils), long sleeved shirt, long pants, shoes plus socks.

Discard clothing and other absorbent materials that may have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS:

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

EXPOSURE GUIDELINES: Refer to Section 2.

ENGINEERING CONTROLS: Refer to product label.

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9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Amber liquid

ODOR: Mild aromatic

DENSITY: 0.967 g/mL at 20°C

pH: 4.44

SOLUBILITY: Emulsifies in water

10. STABILITY AND REACTIVITY

STABILITY: Stable under testing methods (54°C for 14 days).

INCOMPATIBILITY: Incompatible with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

EXPLODABILITY: Not required

OXIDATION/REDUCTION PROPERTIES: Not an oxidizing agent; mild reducing agent

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY/IRRITATION STUDIES

Acute oral LD50 (Rat): Between 2,000 & 5,000 mg/kg

Acute Dermal LD50 (Rat): >5000 mg/kg

Acute Inhalation LC50: > 2.09 mg/L @ 4-hour

Eye Irritation (rabbit): Moderately irritating

Dermal Irritation (rabbit): Moderately irritating

Dermal Sensitization: Not a contact sensitizer

SUBCHRONIC TOXICITY (CLETHODIM): Compound-related effects at high doses were decreased body weights, increased liver size and anemia

CARCINOGENICITY (CLETHODIM): Similar effects as seen in subchronic. No treatment related increases in neoplasms were observed in any study.

TERATOGENICITY (CLETHODIM): Developmental toxicity in rats and rabbits was observed only at maternally toxic dose levels.

REPRODUCTION (CLETHODIM): No reproductive toxicity was observed in a study with rats exposed for two generations.

MUTAGENICITY (CLETHODIM): Negative in the following genotoxicity assays: microbial reverse mutation (Ames Assay), *in vitro* chromosome aberration assay in Chinese Hamster Ovary Cells, *in vivo* chromosome aberration assay in Rat Bone Marrow Cells and *in vivo* Unscheduled DNA Synthesis Assay. Clethodim does not present a genetic hazard to intact animal systems.

TOXICITY OF OTHER INGREDIENTS: This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache, and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting, and diarrhea. Prolonged or repeated dermal exposures may cause drying, scaling, and even blistering of the skin. Aspiration of low viscosity products can cause chemical, which can be fatal. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Symptoms include fatigue, concentration difficulties, anxiety, depression, rapid mood swings and short-term memory loss. The reports are not clear with regard to the types of solvents that may cause these symptoms, and there is controversy among scientists to whether the condition exists or is caused by this type of product. Since many other diseases cause some or all of these conditions, a doctor should be consulted if any appear.

Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and in infants, brain damage. There is limited evidence of fetal and maternal toxicity from exposure to naphthalene.

Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Lesions in the kidneys and thymus, signs of anemia, and reduced spleen weights have been observed in rats and mice chronically exposed via gavage.

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12. ECOLOGICAL INFORMATION

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply where runoff is likely to occur. Do not apply where weather conditions favor drift from areas treated. Do not contaminate water when disposing of equipment washwater or rinsate.

The use of this product may pose a hazard to the federally designated endangered species of Solano Grass and Wild Rice. Use of this product is prohibited in the following areas where the species are known to exist:

Solano Grass:	Solano County, California: The vernal lakes area bounded by the Union Pacific Railroad and Hastings Road to the north, Highway 113 to the east, Highway 12 to the south, and Travis Air Force Base to the west.
Wild Rice:	Hays County, Texas

AVIAN TOXICITY: The acute toxicity of Clethodim Technical to birds is very low.

- Bobwhite quail oral LD₅₀ greater than 2 g/kg
- Bobwhite quail dietary LC₅₀ greater than 6000 ppm
- Mallard duck dietary LC₅₀ greater than 6000 ppm

No reproductive effects were observed in mallard ducks exposed to 100 ppm of Clethodim Technical. In Bobwhite quail, a slight decrease in viability of embryos of eggs from females exposed to 1000 ppm was observed. A NOEL was established at 300 ppm for this study.

AQUATIC ORGANISM TOXICITY: Clethodim Technical is only slightly toxic to freshwater fish and practically nontoxic to daphnia.

- Rainbow Trout 96-hour LC₅₀ = 67 mg/l
- Bluegill Sunfish 96-hour LC₅₀ = 120 mg/l
- Daphnia magna 48-hour LC₅₀ greater than 120 mg/l

OTHER NON-TARGET ORGANISM TOXICITY: Clethodim Technical was found to be nontoxic to adult worker bees at the highest dose tested, 100 micrograms/bee.

13. DISPOSAL CONSIDERATIONS

END USERS MUST DISPOSE OF ANY UNUSED PRODUCT AS PER THE LABEL RECOMMENDATIONS.

Do not contaminate water, food, or feed by storage or disposal or cleaning of equipment. Open dumping is prohibited.

PRODUCT DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Dispose of product containers, waste containers, and residues according to label instructions and local, state, and federal health and environmental regulations.

14. TRANSPORT INFORMATION

DOT CLASSIFICATION:

Non-bulk: Not regulated

Bulk (>119 gallons): NA1993, Combustible liquid, N.O.S. (Naphthalene), PG III*
* For shipments = 563 gallons RQ is required in shipping description.

INTERNATIONAL TRANSPORTATION:

IMO (vessel): Not regulated

IATA (air): Not regulated

15. REGULATORY INFORMATION

SARA TITLE III CLASSIFICATION:

- Section 302: Not applicable.
- Section 311/312: Acute health hazard (immediate)
Delayed health hazard (chronic)
Fire Hazard

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Section 313: Naphthalene CAS# 91-20-3 (2.2%)

CA PROPOSITION 65: This product contains a chemical (Naphthalene) that is known to the State of California to cause cancer.

CERCLA RQ: Naphthalene (91-20-3) RQ=100 lbs (Product= 4,545 lbs/563 gals)

RCRA CLASSIFICATION: Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

TSCA STATUS: The ingredients of this product are listed on the TSCA inventory or are exempt.

16. OTHER INFORMATION

HAZARD RATINGS	NFPA	HMIS	
HEALTH:	1	1	0 MINIMAL
FLAMMABILITY:	2	2	1 SLIGHT
REACTIVITY:	0	0	2 MODERATE
			3 HIGH
			4 SEVERE

MSDS DATE: 9-27-13; Supersedes version dated 5-19-10. Changes made to Sections 1, 3, 4, 7, 8, 12, 13, and 16.

The information contained herein is given in good faith and is believed to be correct, but no warrant, express or implied, is made. Consult Makhteshim Agan of North America, Inc. for further information.

clopyralid

Target Plants: Many annual and perennial broadleaf weeds including knapweeds, thistles, and others in the sunflower, legume, morning-glory and knotweed families. Works well on kudzu.

Resistant Plants: Little effect on grasses; mustard family (Brassicaceae) or several other groups of broad-leaved plants.

Brands: Transline, Stinger, Clean Slate, Clopyralid 3

Signal Word: **CAUTION**

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: TRANSLINE™ Herbicide

Issue Date: 05/22/2015

Print Date: 05/22/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: TRANSLINE™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Flammable liquids - Category 3

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Flammable liquid and vapour.

Precautionary statements**Prevention**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ ventilating/ lighting/ equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Wear protective gloves/ eye protection/ face protection.

Response

IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage

Store in a well-ventilated place. Keep cool.

Disposal

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

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Mixture

This product is a mixture.

Component	CASRN	Concentration
Clopyralid monoethanolamine salt	57754-85-5	40.9%
isopropanol	67-63-0	5.0%
Balance	Not available	54.1%

4. FIRST AID MEASURES

Description of first aid measures

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

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask

etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Skin contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Suitable emergency safety shower facility should be available in work area.

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 work area.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Hemodialysis may be of benefit if substantial amounts have been ingested and the patient is showing signs of intoxication. Consider hemodialysis for patients with persistent hypotension or coma unresponsive to standard therapy (isopropanol levels >400 - 500 mg/dl). (Goldfrank 1998, King et al, 1970). 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. Repeated excessive exposure may aggravate preexisting lung disease.

5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. Container may rupture from gas generation in a fire situation.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. To extinguish combustible residues of this product use water fog, carbon

dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Vapor explosion hazard. Keep out of sewers. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

Methods and materials for containment and cleaning up: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically ground and bond all equipment. Keep out of reach of children. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Do not swallow. Use with adequate ventilation. Keep container closed. Wash thoroughly after handling. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. No smoking, open flames or sources of ignition in handling and storage area. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
isopropanol	ACGIH	TWA	200 ppm
	ACGIH	STEL	400 ppm
	OSHA Z-1	TWA	980 mg/m ³ 400 ppm

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

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If exposure causes eye discomfort, use a full-face respirator.

Skin protection

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

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Red to brown
Odor	Sweet
Odor Threshold	No test data available

pH	7.5 - 8.0
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	100 °C (212 °F)
Flash point	closed cup 47.2 °C (117.0 °F) <i>Closed Cup</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	no data available
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	23.5 mmHg at 20 °C (68 °F)
Relative Vapor Density (air = 1)	1.06 at 20 °C (68 °F)
Relative Density (water = 1)	1.161
Water solubility	Miscible with water
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	7 cP
Kinematic Viscosity	No test data available
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	1.161 g/cm ³ at 20 °C (68 °F) <i>Calculated.</i>
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Unstable at elevated temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid direct sunlight.

Incompatible materials: Avoid contact with: Acids. Halogenated organics. Oxidizers. Avoid contact with metals such as: Aluminum. Zinc. Brass. Copper.

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: Chlorinated pyridine. Hydrogen chloride. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. Observations in animals include: Lethargy.

As product:

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

Acute dermal toxicity

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

As product:

LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to mist. Mist may cause irritation of upper respiratory tract (nose and throat) and lungs. Excessive exposure (400 ppm) to isopropanol may cause eye, nose and throat irritation. Incoordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest and death may follow a longer duration or higher levels. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However, the relevance of this to humans is unknown

As product:

LC50, Rat, male and female, 4 Hour, Aerosol, > 3.0 mg/l

Maximum attainable concentration.

No deaths occurred at this concentration.

Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

May cause mild eye discomfort.

May cause eye irritation.

May cause slight temporary corneal injury.

Vapor may cause eye irritation experienced as mild discomfort and redness.

Sensitization

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

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

Based on available data, repeated exposures are not expected to cause significant adverse effects except at very high aerosol concentrations. Repeated excessive aerosol exposures may cause respiratory tract irritation and even death.

Kidney effects have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans.

For the minor component(s):

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

Liver.

Kidney.

Observations in animals include:

Lethargy.

Carcinogenicity

Similar formulations did not cause cancer in laboratory animals.

Teratogenicity

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

Reproductive toxicity

In animal studies, active ingredient did not interfere with reproduction.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Toxicity

Clopyralid monoethanolamine salt

Acute toxicity to fish

For similar active ingredient(s).

Clopyralid.

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, > 99.9 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

For similar active ingredient(s).

Clopyralid.

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 99.0 mg/l, OECD Test Guideline 202 or Equivalent

Toxicity to Above Ground Organisms

For similar active ingredient(s).

Clopyralid.

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).

For similar active ingredient(s).

Clopyralid.

oral LD50, Anas platyrhynchos (Mallard duck), 14 d, 1465 - 2000mg/kg bodyweight.

For similar active ingredient(s).

Clopyralid.

dietary LC50, Colinus virginianus (Bobwhite quail), 8 d, > 5000mg/kg diet.

For similar active ingredient(s).

Clopyralid.

contact LD50, Apis mellifera (bees), 48 d, > 100micrograms/bee

For similar active ingredient(s).

Clopyralid.

oral LD50, Apis mellifera (bees), 48 d, > 98.1micrograms/bee

isopropanol**Acute toxicity to fish**

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

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 9,640 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

NOEC, alga Scenedesmus sp., static test, 7 d, Growth inhibition (cell density reduction), 1,800 mg/l

ErC50, alga Scenedesmus sp., static test, 72 Hour, Growth rate inhibition, > 1,000 mg/l

Toxicity to bacteria

EC50, activated sludge, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, 30 mg/l

Balance**Acute toxicity to fish**

No relevant data found.

Persistence and degradability**Clopyralid monoethanolamine salt**

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

isopropanol

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

10-day Window: Pass

Biodegradation: 95 %

Exposure time: 21 d

Method: OECD Test Guideline 301E or Equivalent

10-day Window: Pass

Biodegradation: 53 %

Exposure time: 5 d

Method: Other guidelines

Theoretical Oxygen Demand: 2.40 mg/mg Estimated.

Chemical Oxygen Demand: 2.09 mg/mg Estimated.

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	20 - 72 %
20 d	78 - 86 %

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 1.472 d

Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Bioaccumulation: No data available.

Mobility in soil

Clopyralid monoethanolamine salt

For similar active ingredient(s).

Clopyralid.

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

isopropanol

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

Partition coefficient(Koc): 1.1 Estimated.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory

authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Combustible liquid, n.o.s.(Isopropanol)
UN number	NA 1993
Class	CBL
Packing group	III

Classification for SEA transport (IMO-IMDG):

Proper shipping name	FLAMMABLE LIQUID, N.O.S.(Isopropanol)
UN number	UN 1993
Class	3
Packing group	III
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Flammable liquid, n.o.s.(Isopropanol)
UN number	UN 1993
Class	3
Packing group	III

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components

CASRN

isopropanol

67-63-0

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components

CASRN

isopropanol

67-63-0

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-259

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
Harmful if inhaled or absorbed through skin

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity
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2	2	0
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Revision

Identification Number: 101199361 / A211 / Issue Date: 05/22/2015 / Version: 6.0

DAS Code: XRM-3972

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

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.

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

dicamba

Target Plants: Many annual and perennial broadleaf weeds, and some woody plants (including pines) and vines.

Resistant Plants: Many woody plant species are resistant.

Brands: Vanquish, Sterling Blue

Signal Word: **CAUTION**

Use Statement: GENERAL USE



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Vanquish® Herbicide
EPA Reg. No.: 228-397
Product Type: Herbicide

Company Name: Nufarm Americas Inc.
 11901 S. Austin Avenue
 Alsip, IL 60803
 1-800-345-3330

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
 Call CHEMTREC Day or Night: 1-800-424-9300
 For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

HEALTH HAZARDS:

Serious eye damage/eye irritation Category 2A
 Specific target organ toxicity – Repeated exposure Category 2

SIGNAL WORD:

WARNING

HAZARD STATEMENTS:

Causes serious eye irritation.



PRECAUTIONARY STATEMENTS

Wash hands and face thoroughly after handling.

Wear protective gloves. Wear protective clothing. Wear eye protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. If eye irritation persists: Get medical attention.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Diglycolamine Salt of Dicamba	104040-79-1	55 – 58.5
Other Ingredients	Trade Secret	Trade Secret

Synonyms: Mixture containing Dicamba DGA; DGA Salt of Dicamba

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If Swallowed: 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. Do not give anything by mouth to an unconscious person.

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 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 on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Most Important symptoms/effects, acute and delayed: Eye irritation, Skin irritation.

Indication of Immediate medical attention and special treatment if needed: For ingestion there is no specific antidote available. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical, foam or CO₂ extinguishing media.

Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Hazardous Decomposition Materials (Under Fire Conditions): May produce oxides of carbon, hydrogen and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as clay granules, sawdust, or equivalent material for disposal. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE**HANDLING:**

Avoid contact with skin, eyes, or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/ Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

STORAGE:

Store in original container in a well-ventilated area separately from fertilizer, feed and foodstuffs. Avoid cross-contamination with other pesticides. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Engineering Controls:**

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

SAFETY DATA SHEET

Vanquish[®] Herbicide

Personal Protective Equipment:

Eye/Face Protection: Not normally required. To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, shoes plus socks, and chemical-resistant gloves made of any waterproof material. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Dicamba	NE	NE	NE	NE	
Other Ingredients	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, dark green liquid
Odor:	Odorless
Odor threshold:	No data available
pH:	7-8
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	>220° F (closed cup)
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	1 x 10 ⁻⁶ mmHg @ 25°C (dicamba)
Vapor density:	No data available
Relative density:	1.25 g/ml @ 20° C
Solubility(ies):	Soluble
Partition coefficient: n-octanol/water:	No data available
Autoignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Chemical Stability: This material is stable under normal handling and storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: None known

Incompatible Materials: None known

Hazardous Decomposition Products: Under fire conditions may produce oxides of carbon, hydrogen and nitrogen.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, ingestion, eye and skin contact.

Symptoms of Exposure:

Eye Contact: Moderately irritating based on toxicity studies.

Skin Contact: Slightly toxic and non-irritating based on toxicity studies.

Ingestion: Slightly toxic based on toxicity studies.

Inhalation: Low inhalation toxicity.

Delayed, immediate and chronic effects of exposure: None expected.

Toxicological Data:

Data from laboratory studies on this product are summarized below:

Oral: Rat LD₅₀: 3,512 mg/kg

Dermal: Rat LD₅₀: >2,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >5.3 mg/L

Eye Irritation: Rabbit: Moderately irritating

Skin Irritation: Rabbit: Non-irritating

Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to dicamba may cause liver changes or a decrease in body weight.

Carcinogenicity / Chronic Health Effects: Dicamba did not cause cancer in long-term animals studies. The U.S. EPA has given dicamba a Class D classification (not classifiable as to human carcinogenicity).

Reproductive Toxicity: Dicamba did not interfere with fertility in reproduction studies in laboratory animals.

Developmental Toxicity: Animal tests with dicamba have not demonstrated developmental effects.

Genotoxicity: Animal tests with dicamba did not demonstrate mutagenic effects.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

12. ECOLOGICAL INFORMATION

Environmental Hazards:

Do not apply directly to water, or to areas where surface water is present or intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

Ecotoxicity:

Data on Dicamba DGA:

96-hour LC ₅₀ Bluegill:	400 mg/l	Bobwhite Quail 8-day Dietary LC ₅₀ :	>2,248 ppm
96-hour LC ₅₀ Rainbow Trout:	400 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>2,248 ppm
48-hour EC ₅₀ Daphnia:	400 mg/l		

Environmental Fate:

Dicamba poorly binds to soil particles, is potentially mobile in the soil and highly soluble in water. Aerobic soil metabolism is the main degradative process for dicamba with a typical half-life of 2 weeks. Degradation is slower when low soil moisture limits microbe populations. In water, microbial degradation is the main route of dicamba dissipation. Aquatic hydrolysis, volatilization, adsorption to sediments, and bioconcentration are not expected to be significant.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Triple rinse pesticide from containers and use rinsates in the pesticide application. If container is damaged or if pesticide has spilled, contain all spillage. Place in a closed, labeled container for proper disposal. In the event of a major spill, fire, or other emergency, call 1-800-424-9300, day or night. Wastes which cannot be used according to label instructions may be disposed of on site or at an approved waste disposal facility.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Nonrefillable Containers Larger than 5 Gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container

1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable Containers: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT

< 250 gallons per complete package

Non Regulated

≥ 250 gallons per complete package

UN 3082, Environmentally hazardous substances, liquid, n.o.s., (Dicamba), 9, III, RQ

IMDG

Non Regulated

IATA

Non Regulated

15. REGULATORY INFORMATION

EPA FIFRA INFORMATION

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370.66):

Acute Health Hazard , Immediate

Section 313 Toxic Chemical(s):

None

Reportable Quantity (RQ) under U.S. CERCLA:

None

RCRA Waste Code:

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed.

16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 2 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Vanquish is a registered trademark of Syngenta Group Company

Revised: March 30, 2015

Supersedes: May 21, 2013

fluazifop-p-butyl

Target Plants: Annual and perennial grasses only. Used as a post-emergence herbicide for the control grass weeds in various broad-leaved crops

Resistant Plants: Little or no harm to broad-leaved plants.

Brands: Fusilade II, Fusilade DX

Signal Word: **CAUTION**

Use Statement: GENERAL USE

FUSILADE® DX HERBICIDE

Date: 6/24/2016
 Replaces: 6/10/2016

1. PRODUCT IDENTIFICATION

Product identifier on label: **FUSILADE® DX HERBICIDE**

Product No.: A12460A

Use: Herbicide

Manufacturer: Syngenta Crop Protection, LLC
 Post Office Box 18300
 Greensboro NC 27419

Manufacturer Phone: 1-800-334-9481

Emergency Phone: 1-800-888-8372

2. HAZARDS IDENTIFICATION

Classifications: Skin Sensitizer: Category 1B
 Carcinogenicity: Category 2
 Reproductive Toxicity: Category 2
 Aspiration Hazard: Category 1
 Inhalation: Category 2

Signal Word (OSHA): Danger

Hazard Statements: May be fatal if swallowed and enters airways
 May cause an allergic skin reaction
 Fatal if inhaled
 Suspected of causing cancer
 Suspected of damaging fertility or the unborn child

Hazard Symbols:



Precautionary Statements: Do not breathe mist, vapors, spray.
 Use only outdoors or in a well-ventilated area.
 Contaminated work clothing must not be allowed out of the workplace.
 In case of inadequate ventilation wear respiratory protection. See Section 8 Exposure Control/Personal Protection.
 If on skin: Wash with plenty of soap and water.
 If inhaled: Remove person to fresh air and keep comfortable for breathing.
 Immediately call a poison center, doctor or Syngenta.
 Specific treatment is urgent (see Section 4 First Aid Measures).
 If skin irritation or rash occurs: Get medical advice.

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Wash contaminated clothing before reuse.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
If exposed or concerned: Get medical advice/attention.
Wear protective gloves, protective clothing, eye protection.
If swallowed: Immediately call a poison center, doctor or Syngenta.
Do NOT induce vomiting.
Store locked up.
Dispose of contents and container in accordance with local regulations.

Other Hazard Statements: None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Common Name	CAS Number	Concentration
Petroleum distillates, light paraffinic	Petroleum distillates, light paraffinic	64741-89-5	<40.0%
Other ingredients	Other ingredients	Trade Secret	>5.5%
Solvent Naptha (Petroleum), Heavy Aromatic	Aromatic Solvent	64742-94-5	<30.0%
Butyl(RS)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoate	Fluazifop-P-Butyl	79241-46-6	24.5%

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

Have the product container, label or Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison control center or doctor, or going for treatment.

Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Eye Contact: If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Skin Contact: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Inhalation: If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

Most important symptoms/effects:

Allergic skin reaction

Indication of immediate medical attention and special treatment needed:

There is no specific antidote if this product is ingested.

Treat symptomatically.

Persons suffering a temporary allergic reaction may respond to treatment with antihistamines or steroid creams and/or systemic steroids.

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Contains petroleum distillate - vomiting may cause aspiration pneumonia.

5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

Use dry chemical, foam or CO2 extinguishing media. If water is used to fight fire, dike and collect runoff.

Specific Hazards:

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Special protective equipment and precautions for firefighters:

Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures:

Follow exposure controls/personal protection outlined in Section 8.

Methods and materials for containment and cleaning up:

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions in Protective Equipment Section. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

7. HANDLING AND STORAGE

Precautions for safe handling:

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

Conditions for safe storage, including any incompatibilities:

Store locked up.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THIS PRODUCT.

FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Occupational Exposure Limits:

Chemical Name	OSHA PEL	ACGIH TLV	Other	Source
Petroleum distillates, light paraffinic	Not Established	Not Established	Not Established	Not Applicable
Other ingredients	Not Established	Not Established	Not Established	Not Applicable
Aromatic Solvent	Not Established	Not Established	50 mg/m ³ (8 ppm) TWA	Manufacturer
Fluazifop-P-Butyl	Not Established	Not Established	0.5 mg/m ³ TWA	Syngenta

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Appropriate engineering controls:

Use effective engineering controls to comply with occupational exposure limits (if applicable).

Individual protection measures:

Ingestion:

Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

Eye Contact:

Where eye contact is likely, use chemical splash goggles.

Skin Contact:

Where contact is likely, wear chemical-resistant gloves (such as barrier laminate, nitrile rubber, neoprene rubber or Viton), coveralls, socks and chemical-resistant footwear.

Inhalation:

A combination particulate/organic vapor respirator should be used until effective engineering controls are installed to comply with occupational exposure limits, or until exposure limits are established. Use a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R, P or HE filter.

Use a self-contained breathing apparatus in cases of emergency spills, when exposure levels are unknown, or under any circumstances where air-purifying respirators may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Dark brown liquid, free of sediment
 Odor: Aromatic
 Odor Threshold: Not Available
 pH: 6.2 (1% w/w dilution in deionized water)
 Melting point/freezing point: Not Applicable
 Initial boiling point and boiling range: Not Available
 Flash Point (Test Method): > 212°F (TCC)
 Flammable Limits (% in Air): Not Available
 Flammability: Not Applicable
 Vapor Pressure: Fluazifop-P-Butyl 4.5 x 10⁻⁷ mmHg @ 68°F (20°C)
 Vapor Density: Not Available
 Relative Density: 0.981 g/cm³
 Solubility (ies): Fluazifop-P-Butyl Almost insoluble in water (1 mg/l @ pH 5 - 6.5)
 Partition coefficient: n-octanol/water: Not Available
 Autoignition Temperature: Not Available
 Decomposition Temperature: Not Available
 Viscosity: Not Available
 Other: None

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10. STABILITY AND REACTIVITY

- Reactivity: Not reactive.
- Chemical stability: Stable under normal use and storage conditions.
- Possibility of hazardous reactions: Will not occur.
- Conditions to Avoid: None known.
- Incompatible materials: None known.
- Hazardous Decomposition Products: None known.

11. TOXICOLOGICAL INFORMATION

Health effects information

Likely routes of exposure: Dermal, Inhalation

Symptoms of exposure: Rash, redness or itching

Delayed, immediate and chronic effects of exposure: Developmental toxicity, Possible carcinogenicity, Allergic skin reaction

Numerical measures of toxicity (acute toxicity/irritation studies (finished product))

- Ingestion: Oral (LD50 Rat) : > 5000 mg/kg body weight
- Dermal: Dermal (LD50 Rabbit) : > 2000 mg/kg body weight
- Inhalation: Inhalation (LC50 Animal Not Available) : 0.54 mg/l air - 4 hours
- Eye Contact: Slightly Irritating (Rabbit)
- Skin Contact: Moderately Irritating (Rabbit)
- Skin Sensitization: See "Other Toxicity Information", Sec. 11

Reproductive/Developmental Effects

Fluazifop-P-Butyl : Embryo/foetoxic effects have been reported in rats. Did not show teratogenic effects in animal experiments.

Chronic/Subchronic Toxicity Studies

Fluazifop-P-Butyl : Effects on red cells, bone marrow, liver and spleen observed in long-term high dose feeding tests in dogs. No adverse health effects are expected in humans at airborne levels below the occupational exposure limit.

Carcinogenicity

Fluazifop-P-Butyl : Did not show mutagenic effects in animal experiments. Did not show carcinogenic effects in animal experiments.

Chemical Name	NTP/IARC/OSHA Carcinogen
Petroleum distillates, light paraffinic	No
Other ingredients	No
Solvent Naptha (Petroleum), Heavy Aromatic	No

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Butyl(RS)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoate No

Other Toxicity Information

Repeated and/or prolonged contact may cause skin sensitization.

Toxicity of Other Components

Aromatic Solvent

May cause irritation to the eyes, skin and respiratory system.
May cause dizziness or drowsiness. Aspiration hazard.

Other ingredients

Not Established

Petroleum distillates, light paraffinic

May cause respiratory tract irritation. Harmful if swallowed. Pulmonary aspiration hazard.

Target Organs

Active Ingredients

Fluazifop-P-Butyl : Blood, bone marrow, liver, spleen

Inert Ingredients

Aromatic Solvent: Eye, skin, respiratory system, nervous system

Other ingredients: Not Established

Petroleum distillates, light paraffinic: Respiratory tract

12. ECOLOGICAL INFORMATION

Eco-Acute Toxicity

Fluazifop-P-Butyl :

Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 6.02 ppm

Green Algae 4-day EC50 > 1.8 ppm

Bird (Mallard Duck) 14-day LD50 > 3528 mg/kg

Environmental Fate

Fluazifop-P-Butyl :

The information presented here is for the active ingredient, fluazifop-p-butyl.
Not persistent in soil or water.

13. DISPOSAL CONSIDERATIONS

Disposal:

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

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14. TRANSPORT INFORMATION

DOT Classification

Ground Transport - NAFTA

< 300 gallons: Not regulated

> 300 gallons:

Proper Shipping Name: Other Regulated Substances, Liquid, N.O.S. (RQ - Naphthalene)

Hazard Class: Class 9

Identification Number: NA 3082

Packing Group: PG III

Comments

Water Transport - International

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Fluazifop), Marine Pollutant

Hazard Class: Class 9

Identification Number: UN 3082

Packing Group: PG III

Air Transport

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Fluazifop)

Hazard Class: Class 9

Identification Number: UN 3082

Packing Group: PG III

15. REGULATORY INFORMATION

Pesticide Registration:

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: Harmful if absorbed through skin. Harmful if inhaled. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing (spray mist or vapor). Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

EPA Registration Number(s):

100-1070

EPCRA SARA Title III Classification:

Section 311/312 Hazard Classes: Acute Health Hazard
Chronic Health Hazard

Section 313 Toxic Chemicals: Aromatic Solvent <30.0% (CAS No. 64742-94-5)

California Proposition 65:

This product contains a chemical(s) known to the state of California to cause cancer and birth defects or other reproductive harm.

CERCLA/SARA 304 Reportable Quantity (RQ):

Report product spills > 305 gal. (based on naphthalene [RQ = 100 lbs.] content in the formulation)

RCRA Hazardous Waste Classification (40 CFR 261):

Not Applicable

TSCA Status:

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Exempt from TSCA, subject to FIFRA

16. OTHER INFORMATION

NFPA Hazard Ratings

Health: 2
 Flammability: 1
 Instability: 0

HMIS Hazard Ratings

Health: 2
 Flammability: 1
 Physical Hazard: 0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme
*	Chronic

Syngenta Hazard Category: D,S

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 10/19/1998
 Revision Date: 6/24/2016 Replaces: 6/10/2016
 Section(s) Revised: 2, 11, 16

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

fosamine

Target Plants: Labeled for broad-spectrum woody plant control. Used for postharvest control of pine and hardwood species for southern pine planting site preparation.

Resistant Plants: Non-woody plants (usually) and waxy leafed species

Brands: Krenite S

Signal Word: **CAUTION**

Use Statement: GENERAL USE

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY ADDRESS:
ALBAUGH, INC.
Ankeny, IA 50021

EMERGENCY TELEPHONE NUMBERS:
(800) 424-9300 (CHEMTREC, transportation and spills)

PRODUCT NAME : **KRENITE S**
CHEMICAL NAME : Ammonium salt of Fosamine
CHEMICAL FAMILY : Herbicide
PRODUCT CODE : EPA Reg. No. 42750-247

SECTION 2 - COMPOSITION, INFORMATION OF INGREDIENTS

COMPONENT	PERCENTAGE	CAS NUMBER	OSHA PEL	ACIGH TLV
Ammonium Salt of Fosamine	41.5 %	25954-13-6	NOT EST	NOT EST
Inert Ingredients	58.5 %	n/a	n/a	n/a

SECTION 3 - HAZARDS IDENTIFICATION SUMMARY

(As defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200)

HEALTH HAZARDS: CAUTION. Causes moderate to severe eye irritation..

PHYSICAL HAZARDS: May release toxic gasses when burned

ENVIRONMENTAL HAZARDS: May be toxic to non-target plants.

SECTION 4 - FIRST AID MEASURES

IF IN EYES: 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.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT (method): Will not flash.

FLAMMABLE LIMITS: Not Established

FIRE AND EXPLOSION HAZARD: May decompose in fire due releasing irritating or toxic gases.

EXTINGUISHING MEDIA: Use water spray, foam or dry chemical.

FIGHTING INSTRUCTIONS: Evacuate area and fight fire upwind from a safe distance to avoid hazardous vapors and decomposition products. Foam or dry chemical extinguishing systems recommended to prevent environmental damage due to water run off.

FIREFIGHTING EQUIPMENT: Self-contained breathing apparatus with full facepiece. Full firefighting turn-out gear (Bunker gear).

HAZARDOUS COMBUSTION PRODUCTS: Unknown

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Clean up spills immediately, observing precautions in Section 8 of this document. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

SMALL SPILL: Absorb small spills on sand, vermiculite or other inert absorbent. Place contaminated material in appropriate container for disposal.

LARGE SPILL: Dike large spills using absorbent or impervious material such as clay or sand. Recover and contain as much free liquid as possible for reuse. Allow absorbed material to solidify, and scrape up for disposal. After removal, scrub the area with detergent and water and neutralize with dilute alkaline solutions of soda ash, or lime.

Wear appropriate personal protection equipment. (See Section 8 Exposure Controls, Personal Protection.)

SECTION 7 - HANDLING AND STORAGE

CAUTION KEEP OUT OF REACH OF CHILDREN!

HANDLING: Use only in a well-ventilated area. Wear appropriate safety equipment when handling.

STORAGE: Store in original container with lid tightly closed. Keep away from food, feed and drinking water.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS (8 hour TWA, ppm): Refer to Section 3.

ENGINEERING CONTROLS: Proper ventilation is required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Local mechanical exhaust ventilation may be required. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION - Safety goggles when mixing, loading or cleaning equipment is recommended.

CLOTHING – Long-sleeved shirt and long pants, Shoes plus socks,

GLOVES – Waterproof gloves when mixing, loading or cleaning equipment is recommended.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:	Clear to amber liquid.
ODOR:	Slight ammonia like.
SPECIFIC GRAVITY:	1.17 (9.7 – 9.9 lb/gl)*
pH:	Unknown
VAPOR PRESSURE:	Unknown
WATER SOLUBILITY:	Emulsifies.

*Listed density is an approximate value and does not necessarily represent that of a specific batch.

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable, however may decompose if heated.

CONDITIONS TO AVOID: Avoid temperatures above (115°F, 46°C) and below 25°F (-5°C).

INCOMPATIBILITY WITH OTHER MATERIALS: Strong oxidizers or bases, mild and galvanized steel.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, Nitrogen oxides, phosphorous oxides.

HAZARDOUS POLYMERIZATION: Product will not undergo polymerization.

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

Oral LD ₅₀ (rat)	- > 5,000 mg/kg
Dermal LD ₅₀ (rabbit)	- > 5,000 mg/kg
Inhalation LC ₅₀ (rat)	- > 5.5 mg/L
Eye Irritation (rabbit)	- Moderate to severe
Skin Irritation (rabbit)	- Mild
Sensitization (guinea pig)	- Non-sensitizer

CARCINOGEN STATUS:

OSHA - Not listed

NTP - Not listed

IARC - Not listed

MUTAGENIC DATA: No evidence of mutagenic effects during *in vivo* or *in vitro* studies.

ADDITIONAL DATA: None

SECTION 12 - ECOLOGICAL INFORMATION

ENVIRONMENTAL SUMMARY: 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 by cleaning of equipment or disposal of equipment washwaters.

FISH TOXICITY: (Fosamine ammonium)

96 hour LC₅₀, Rainbow trout – 330 mg/L

96 hour LC₅₀, Bluegill – 590 mg/L

AVIAN TOXICITY: (Glyphosate acid)

Oral LD₅₀, Bobwhite quail – > 5,000 mg/Kg

Oral LD₅₀, Mallard duck – > 5,000 mg/Kg

BEE: Unknown

SECTION 13 - DISPOSAL CONSIDERATIONS

Do not contaminate water, food, or feed by storage or disposal.

WASTE: Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER: Container cleaning and disposal depends on the type of container being used. Refer to product label for appropriate cleaning and disposal instructions.

SECTION 14 - TRANSPORT INFORMATION

DOT SHIPPING DESCRIPTION: Not regulated by DOT

DOT HAZARD CLASS: N/A

UN NUMBER: N/A

DOT PACKING GROUP: N/A

DOT PRIMARY/SECONDARY LABEL: N/A

DOT PRIMARY/SECONDARY PLACARD: N/A

DOT EMERGENCY RESPONSE GUIDE #: N/A

SECTION 15 - REGULATORY INFORMATION

CERCLA REPORTABLE QUANTITY: Not listed

SARA TITLE III STATUS:
 311/312 Hazard Categories – Immediate Health
 313 Toxic Chemicals – None known

CALIFORNIA PROP 65: Not listed

SECTION 16 - OTHER INFORMATION

HMIS HAZARD RATINGS	HEALTH	1
	FLAMMABILITY	0
	PHYSICAL HAZARD	1
4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal		

DISCLAIMER: The information presented herein is based on available data from reliable sources and is correct to the best of Albaugh's knowledge. Albaugh makes no warranty, express or implied, regarding the accuracy of the data or the results obtained from the use of this product. Nothing herein may be construed as recommending any practice or any product in violation of any law or regulations. The user is solely responsible for determining the suitability of any material or product for a specific purpose and for adopting any appropriate safety precautions.

REVISED DATE: August, 2012
REFERENCE: Initial release

glyphosate

Target Plants: Non-selective, systemic herbicide that can control most annual, biennial, and perennial plants. Some woody plants including conifers.

Resistant Plants: Hickory, greenbriar, Virginia creeper, trumpet vine.

Brands: Accord XRT II, Foresters, Glyphosate 54, Mad Dog 54, Mad Dog Plus, Makaze, Razor, Razor Pro, Rodeo, Roundup Custom, Roundup Pro Concentrate, Roundup ProMax

Signal Word: **CAUTION**

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: ACCORD™ XRT II Herbicide

Issue Date: 10/23/2015

Print Date: 10/23/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: ACCORD™ XRT II Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994

info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Eye irritation - Category 2B

Skin sensitisation - Sub-category 1B

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

May cause an allergic skin reaction.
Causes eye irritation.

Precautionary statements**Prevention**

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves.

Response

IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Plant growth regulator
This product is a mixture.

Component	CASRN	Concentration
Glyphosate DMA Salt	34494-04-7	50.2%
Balance	Not available	49.8%

4. FIRST AID MEASURES

Description of first aid measures

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

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

Skin contact: Take off contaminated clothing. 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.

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 work area.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

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

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

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

None established

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: 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.

Other 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.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Yellow
Odor	Amine.
Odor Threshold	No data available
pH	4.59 <i>pH Electrode</i>
Melting point/range	Not applicable
Freezing point	No data available
Boiling point (760 mmHg)	No data available
Flash point	closed cup > 100 °C (> 212 °F) <i>Setaflash Closed Cup ASTM D3828</i>
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	No data available
Water solubility	Soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No test data available
Dynamic Viscosity	32.5 mPa.s at 40 °C (104 °F) 62.3 mPa.s at 20 °C (68 °F)
Kinematic Viscosity	No data available
Explosive properties	No
Oxidizing properties	No significant increase (>5C) in temperature.

Liquid Density 1.2114 g/cm³ at 20 °C (68 °F) *Digital density meter*
Molecular weight No data available

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures.

Incompatible materials: Avoid contact with: Acids. Halogens. Oxidizers. Peroxides. Flammable hydrogen may be generated from contact with metals such as: Steel.

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 monoxide. Carbon dioxide. Hydrocarbons. Nitrogen oxides. Phosphorus oxides.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

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

As product:

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

Acute dermal toxicity

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

As product:

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

Acute inhalation toxicity

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

As product:

LC50, Rat, male and female, 4 Hour, Aerosol, > 5.63 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation.

May cause slight corneal injury.

Sensitization

Has demonstrated the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For similar material(s):

Glyphosate.

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

Carcinogenicity

For similar active ingredient(s). Glyphosate. Did not cause cancer in laboratory animals. Weight of evidence evaluation of epidemiology studies supports no association between glyphosate exposure and cancer.

Teratogenicity

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.

Reproductive toxicity

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.

Mutagenicity

This material was not mutagenic in an Ames bacterial assay. Animal genetic toxicity studies were negative.

Genetic Toxicity in vivo

Mouse Bone Marrow Micronucleus Test Mouse male Oral gavage negativeResult: negative

Aspiration Hazard

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

Carcinogenicity**Component**

Glyphosate DMA Salt

List

IARC

Classification

Group 2A: Probably carcinogenic to humans

12. ECOLOGICAL INFORMATION

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

Toxicity

Acute toxicity to fish

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), static test, 96 Hour, 11 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 17 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, 2.1 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

oral LD50, Coturnix japonica (Japanese quail), > 2250mg/kg bodyweight.

oral LD50, Apis mellifera (bees), 48 Hour, > 250µg/bee

contact LD50, Apis mellifera (bees), 48 Hour, > 250µg/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, survival, > 996.6 mg/kg

Persistence and degradability

Glyphosate DMA Salt

Biodegradability: For similar active ingredient(s). Glyphosate. Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Glyphosate DMA Salt

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

Balance

Bioaccumulation: No relevant data found.

Mobility in soil

Glyphosate DMA Salt

For similar active ingredient(s).

Glyphosate.
Expected to be relatively immobile in soil (Koc > 5000).

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Glyphosate)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	Glyphosate
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(Glyphosate)
UN number	UN 3082
Class	9
Packing group	III

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate health hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

The following product components are cited in the Pennsylvania Special Hazardous Substance List, and are present at levels which require reporting.

Components	CASRN
Formaldehyde	50-00-0

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-556

CAUTION

Causes moderate eye irritation
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101223205 / A211 / Issue Date: 10/23/2015 / Version: 4.0

DAS Code: GF-1280

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

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.

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

hexazinone

Target Plants: Controls some grasses, many annual and perennial broadleaves, and some woody species especially oak and hickory.

Resistant Plants: Yellow-poplar, eastern redcedar, sassafras, blackgum, hollies, American beautyberry, Bermudagrass, white snakeroot, broomsedge, Johnsongrass, sicklepod, trumpet creeper, morning glory. Most conifer species show resistance.

Brands: Velpar L, Velpar DF, Pronone, Velossa

Signal Word: **DANGER**
(on at least one product)

Use Statement: General Use

**DuPont™ Velpar® L Herbicide**

Version 2.0

Revision Date 05/28/2015

Ref. 130000000166

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : DuPont™ Velpar® L Herbicide
Tradename/Synonym : DPX-A3674 250SL
Hexazinone:[3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione]
Velpar® L

Product Use : Herbicide

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

Manufacturer/Supplier : DuPont
4417 Lancaster Pike
Wilmington, DE 19805, USA

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION**Product hazard category**

Serious eye damage/eye irritation Category 1
Specific target organ toxicity - repeated exposure Category 2

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Label content

Pictogram :



Signal word :

Danger

Hazardous warnings :

Causes serious eye damage.
May cause damage to organs through prolonged or repeated exposure.
(Respiratory system, Kidney)

Hazardous prevention measures :

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wear eye protection/ face protection.
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.
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

No applicable data available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Hexazinone	51235-04-2	25 %
Sodium alkylnaphthalene sulfonate		1 - 5 %


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Other Ingredients		75 %
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Includes percentages of the following:

Ethanol	64-17-5	40 - 45 %
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SECTION 4. FIRST AID MEASURES

- General advice : 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 1-800-441-3637. See Label for Additional Precautions and Directions for Use.
- Inhalation : Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.
- 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.
- 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.
- Ingestion : 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/effects, acute and delayed : No applicable data available.
- Protection of first-aiders : No applicable data available.


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Notes to physician : Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray, Dry chemical, Foam, Carbon dioxide (CO₂)
- Unsuitable extinguishing media : High volume water jet, (contamination risk)
- Specific hazards : Vapours may form explosive mixtures with air.
- Special protective equipment for firefighters : Wear full protective clothing and self-contained breathing apparatus. Use personal protective equipment.
- Further information : Evacuate personnel and keep upwind of fire.
(on small fires) If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the area contaminated. Do not allow run-off from fire fighting to enter drains or water courses. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel) : Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Use personal protective equipment.
- Environmental precautions : Prevent material from entering sewers, waterways, or low areas.
- Spill Cleanup : Soak up with sawdust, sand, oil dry or other absorbent material. Dispose of in an approved container.
If liquid has been spilt in large quantities clean up promptly by scoop or vacuum.
- Accidental Release Measures : Never return spills in original containers for re-use. Dispose of in accordance with local regulations.



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SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Do not breathe vapor or mist. Avoid contact with skin, eyes and clothing. 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. As soon as possible, wash thoroughly and change into clean clothing.
- Handling (Physical Aspects) : Keep away from heat and sources of ignition.
- Dust explosion class : No applicable data available.
- Storage : Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children.
- Storage period : No applicable data available.
- Storage temperature : No applicable data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Engineering controls : Ensure adequate ventilation.
- Personal protective equipment
 - Skin and body protection : Applicators and other handlers must wear:
 - Long sleeved shirt and long pants
 - Shoes plus socks
 - Protective eyewear
 - PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:
 - Coveralls
 - Chemical resistant gloves made of any waterproof material
 - Shoes plus socks
 - Protective eyewear
- Protective measures : Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow



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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. Use this product in accordance with its label.

Exposure Guidelines
Exposure Limit Values

Hexazinone				
AEL *	(DUPONT)	10 mg/m3	8 & 12 hr. TWA	Total dust
AEL *	(DUPONT)	5 mg/m3	8 & 12 hr. TWA	Respirable dust.
Sodium alkylnaphthalene sulfonate				
AEL *	(DUPONT)	0.05 mg/m3	8 & 12 hr. TWA	
Ethanol				
Permissible exposure limit:	(OSHA)	1,000 ppm	1,900 mg/m3	8 hr. TWA
TLV	(ACGIH)	1,000 ppm	STEL	
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA	

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	: liquid
Form	: liquid
Color	: light yellow
Odor	: alcohol-like
Odor threshold	: No applicable data available.
pH	: No applicable data available.
Melting point/range	: No applicable data available.

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Boiling point/boiling range	: No applicable data available.
Flash point	: No applicable data available.
Evaporation rate	: No applicable data available.
Flammability (solid, gas)	: No applicable data available.
Upper explosion limit	: No applicable data available.
Lower explosion limit	: No applicable data available.
Vapor pressure	: 33 mm Hg at 25 °C (77 °F)
Vapour density	: No applicable data available.
Specific gravity (Relative density)	: 0.9776
Water solubility	: dispersible
Solubility(ies)	: No applicable data available.
Partition coefficient: n-octanol/water	: No applicable data available.
Auto-ignition temperature	: No applicable data available.
Decomposition temperature	: No applicable data available.
Viscosity, kinematic	: No applicable data available.
Viscosity, dynamic	: No applicable data available.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No applicable data available.
Chemical stability	: Stable at normal temperatures and storage conditions.
Possibility of hazardous reactions	: Polymerization will not occur.
Conditions to avoid	: None reasonably foreseeable.


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Incompatible materials : strong acids and bases (slowly hydrolyzes)

Hazardous decomposition products : No applicable data available.

SECTION 11. TOXICOLOGICAL INFORMATION

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Inhalation 4 h LC50 : > 5.0 mg/l , Rat

Dermal LD50 : > 5,000 mg/kg , Rabbit

Oral LD50 : 4,120 mg/kg , Rat

Skin irritation : No skin irritation, Rabbit
Minimal effects that do not meet the threshold for classification.

Eye irritation : Corrosive, Rabbit

Sensitisation : Did not cause sensitisation on laboratory animals., Guinea pig

Hexazinone

Repeated dose toxicity : No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification., The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.

Oral
Dog

-
Reduced body weight gain, Liver effects, Organ weight changes, altered blood chemistry

Oral
Rat

-
Reduced body weight gain, Organ weight changes, Liver

Carcinogenicity : Not classifiable as a human carcinogen.
Overall weight of evidence indicates that the substance is not carcinogenic.


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Mutagenicity : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Animal testing did not show any mutagenic effects.

Reproductive toxicity : No toxicity to reproduction
Reduced body weights in offspring at maternally toxic doses.

Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.
Reduced body weights in offspring at maternally toxic doses.

Sodium alkylnaphthalene sulfonate
Repeated dose toxicity

: Inhalation
Rat
-
Target Organs: Respiratory Tract
Respiratory tract damage, Pathologic changes

Oral
Rat
-
Target Organs: Kidney
Kidney effects, Reduced body weight gain

Reproductive toxicity : No toxicity to reproduction
Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.

Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

Ethanol

Repeated dose toxicity : Oral
Rat
-
No toxicologically significant effects were found.

Inhalation
Rat
-


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No toxicologically significant effects were found.

- Carcinogenicity** : Not classifiable as a human carcinogen.
Overall weight of evidence indicates that the substance is not carcinogenic.
- Mutagenicity** : Animal testing did not show any mutagenic effects.
Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
- Reproductive toxicity** : No toxicity to reproduction
Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.
- Teratogenicity** : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

Carcinogenicity

The carcinogenicity classifications for this product and/or its ingredients have been determined according to HazCom 2012, Appendix A.6. The classifications may differ from those listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or those found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition).

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 12. ECOLOGICAL INFORMATION**Aquatic Toxicity**

DuPont™ Velpar® L Herbicide

- 96 h LC50 : Pimephales promelas (fathead minnow) 274 mg/l
- 96 h LC50 : Lepomis macrochirus (Bluegill sunfish) > 370 mg/l
- 96 h LC50 : Oncorhynchus mykiss (rainbow trout) > 320 mg/l

Hexazinone

- 120 h ErC50 : Skeletonema costatum (Diatom) 0.022 mg/l
- 120 h NOEC : Skeletonema costatum (Diatom) 0.0041 mg/l


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Ethanol	48 h EC50	: Daphnia magna (Water flea) 152 mg/l
	96 h ErC50	: Pseudokirchneriella subcapitata (green algae) 675 mg/l OECD Test Guideline 201
	48 h EC50	: Daphnia magna (Water flea) 5,012 mg/l
	30 d	: NOEC Fish (unspecified species) 245 mg/l
Additional ecological information		: Environmental Hazards: 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 washwaters or rinsate. The active ingredient, hexazinone, in this product is known to leach through soil into ground water under certain conditions as a result of agricultural use.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste disposal methods - Product	:	Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.
Waste disposal methods - Container	:	Refer to the product label for instructions. Do not transport if this container is damaged or leaking. In the event of a major spill, fire or other emergency, call 1-800-441-3637 day or night.
Contaminated packaging	:	No applicable data available.

SECTION 14. TRANSPORT INFORMATION

DOT	UN number	:	1170
	Proper shipping name	:	Ethanol solutions
	Class	:	3
	Packing group	:	III
	Labelling No.	:	3

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IATA_C	UN number	: 1170
	Proper shipping name	: Ethanol solution
	Class	: 3
	Packing group	: III
	Labelling No.	: 3
IMDG	UN number	: 1170
	Proper shipping name	: ETHANOL SOLUTION
	Class	: 3
	Packing group	: III
	Labelling No.	: 3

SECTION 15. REGULATORY INFORMATION

Other regulations : This Safety Data Sheet is for a pesticide product registered by the US Environmental Protection Agency (USEPA) and is therefore also subject to certain labeling requirements under US pesticide law (FIFRA). These requirements differ from the classification criteria and hazard information required by OSHA for safety data sheets, and for workplace labels of non-pesticide chemicals. The following is the mandatory hazard information required by USEPA on the pesticide label:

Danger

Causes irreversible eye damage. Do not get in eyes or on clothing. Wash thoroughly with soap and water after handling. Corrosive

Title III hazard classification : Acute Health Hazard: Yes
Chronic Health Hazard: No
Fire: Yes
Reactivity/Physical hazard: No
Pressure: No

EPA Reg. No. : 352-392
In the United States this product is regulated by the US Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.



DuPont™ Velpar® L Herbicide

Version 2.0

Revision Date 05/28/2015

Ref. 130000000166

California Prop. 65 : WARNING! This product contains a chemical or chemicals known to the State of California to cause cancer.
WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

SECTION 16. OTHER INFORMATION

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Revision Date : 05/28/2015

Contact person : DuPont Crop Protection, Wilmington, DE, 19898, Phone: 1-888-638-7668

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.

Significant change from previous version is denoted with a double bar.

imazapyr

Target Plants: Non-selective herbicide for grasses, broadleaves, vines, brambles, shrubs and trees, riparian and emerged aquatics. Very effective on perennial grasses, including difficult to control species like Bermudagrass, seedling Johnsongrass, and Panicums.

Resistant Plants: Conifers generally tolerant. Elms, woody legumes, wax myrtle, croton, blackberry (Rubus), buckeye, baccharis, pine. Weak on broadleaf weeds in the composite group.

Brands: 4 pound formulations: Arsenal AC, Polaris AC, Imazapyr 4SL

2 pound formulations: Chopper Gen2, Polaris SP, Imazapyr 2SL, Rotary 2SL

Note: Some 2 pound formulations contain a surfactant and should not to be applied over the top of crop trees.

Signal Word: **CAUTION**

Use Statement: GENERAL USE

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1. Identification

Product identifier used on the label

ARSENAL HERBICIDE APPL. CONC.

Recommended use of the chemical and restriction on use

Recommended use*: herbicide

* The "Recommended use" identified for this product is provided solely to comply with a US Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:
BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Substance number: 57487
EPA Register number: 241-299
Molecular formula: C(13) H(15) N(3) O(3). C(3) H(9) N
Chemical family: imidazole derivative
Synonyms: Isopropylamine salt of imazapyr

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Aquatic Acute	1	Hazardous to the aquatic environment - acute
Aquatic Chronic	1	Hazardous to the aquatic environment - chronic

Label elements

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The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

Labeling of special preparations (GHS):

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 0 - 1 % dermal

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 0 - 1 % oral

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 0 - 1 % Inhalation - vapour

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 0 - 1 % Inhalation - mist

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:

KEEP OUT OF REACH OF CHILDREN.

Avoid contact with the skin, eyes and clothing.

Avoid inhalation of mists/vapours.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
81510-83-0	53.1 %	Isopropylamine salt of imazapyr
64-19-7	0.1 - 1.0 %	Acetic acid
75-31-0	5.0 - 10.0 %	isopropylamine

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
81510-83-0	53.1 %	Isopropylamine salt of imazapyr
	46.9 %	Proprietary ingredients

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air.

If on skin:

Wash thoroughly with soap and water.

If in eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

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If swallowed:

Rinse mouth and then drink plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms: No significant reaction of the human body to the product known.

Indication of any immediate medical attention and special treatment needed

Note to physician

Antidote: No known specific antidote.

Treatment: Treat symptomatically.

Treatment: Symptomatic treatment (decontamination, vital functions).

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
foam, dry powder, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons,
If product is heated above decomposition temperature, toxic vapours will be released. The substances/groups of substances mentioned can be released if the product is involved in a fire.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Evacuate area of all unnecessary personnel. Contain contaminated water/firefighting water. Do not allow to enter drains or waterways.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

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7. Handling and Storage

Precautions for safe handling

RECOMMENDATIONS ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. PESTICIDE APPLICATORS & WORKERS must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170. Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary). Keep away from sources of ignition - No smoking. Keep container tightly sealed. Protect contents from the effects of light. Protect against heat. Protect from air. Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible. Avoid aerosol formation. Avoid dust formation. Provide means for controlling leaks and spills. Do not return residues to the storage containers. Follow label warnings even after container is emptied. The substance/ product may be handled only by appropriately trained personnel. Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapours. Wear suitable personal protective clothing and equipment.

Protection against fire and explosion:

The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

Conditions for safe storage, including any incompatibilities

Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

Further information on storage conditions: Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

8. Exposure Controls/Personal Protection

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Components with occupational exposure limits

isopropylamine	OSHA PEL	PEL 5 ppm 12 mg/m ³ ; STEL value 10 ppm 24 mg/m ³ ; TWA value 5 ppm 12 mg/m ³ ;
	ACGIH TLV	TWA value 5 ppm ; STEL value 10 ppm ;

Advice on system design:

Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal protective equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and

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vapours. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves, Protective glove selection must be based on the user's assessment of the workplace hazards.

Eye protection:

Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment. Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice. Personal protective equipment should be decontaminated prior to reuse. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift. No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	strong, ammonia-like	
Odour threshold:		Not determined due to potential health hazard by inhalation.
Colour:	green	
pH value:	approx. 5 - 7	(1 %(m), 20 °C)
Freezing point:	approx. 0 °C	(1,013.3 hPa) Information applies to the solvent.
Boiling point:	approx. 100 °C	(1,013.3 hPa) Information applies to the solvent.
Flash point:		not applicable Aqueous preparation
Flammability:	not applicable	
Lower explosion limit:		As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:		As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Autoignition:		not applicable Information applies to the solvent.
Vapour pressure:	approx. 23.4 hPa	(20 °C) Information applies to the solvent.

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Density:	approx. 1.11 g/cm ³	(20 °C)
Vapour density:		not applicable
Partitioning coefficient n-octanol/water (log Pow):		not applicable
Thermal decomposition:	carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released. If product is heated above decomposition temperature hazardous fumes may be released.	
Viscosity, dynamic:	approx. 46.5 mPa.s	(20 °C)
Solubility in water:		readily soluble
Molar mass:	320.4 g/mol	
Evaporation rate:		not applicable
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.	

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Oxidizing properties:
not fire-propagating
Not an oxidizer.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.

Hazardous polymerization will not occur. No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid prolonged storage. Avoid electro-static discharge. Avoid contamination. Avoid prolonged exposure to extreme heat. Avoid extreme temperatures.

Incompatible materials

oxidizing agents, strong alkalis

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated., Prolonged thermal loading can result in products of degradation being given off.

Thermal decomposition:

Possible thermal decomposition products:

carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons

Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released. If product is heated above decomposition temperature hazardous fumes may be released.

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11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Relatively nontoxic after single ingestion. Slightly toxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

Oral

Type of value: LD50
Species: rat
Value: > 5,000 mg/kg

Inhalation

Type of value: LC50
Species: rat (male/female)
Value: > 5.0 mg/l (OECD Guideline 403)
Exposure time: 4 h
An aerosol was tested.
No mortality was observed.

Dermal

Type of value: LD50
Species: rabbit
Value: > 5,000 mg/kg

Irritation / corrosion

Assessment of irritating effects: May cause slight but temporary irritation to the eyes. May cause slight irritation to the skin.

Skin

Species: rabbit
Result: Slightly irritating.
Method: Primary skin irritation test

Eye

Species: rabbit
Result: non-irritant

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Buehler test

Species: guinea pig
Result: Skin sensitizing effects were not observed in animal studies.
Method: OECD Guideline 406

Chronic Toxicity/Effects

Repeated dose toxicity

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Assessment of repeated dose toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. No substance-specific organotoxicity was observed after repeated administration to animals.

Genetic toxicity

Assessment of mutagenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Mutagenicity tests revealed no genotoxic potential.

Carcinogenicity

Assessment of carcinogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of various animal studies gave no indication of a carcinogenic effect.

Reproductive toxicity

Assessment of reproduction toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity

Assessment of teratogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Animal studies gave no indication of a developmental toxic effect at doses that were not toxic to the parental animals.

Other Information

Misuse can be harmful to health.

Symptoms of Exposure

No significant reaction of the human body to the product known.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to fish. There is a high probability that the product is not acutely harmful to aquatic invertebrates. Acutely harmful for aquatic plants.

Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. The product has not been tested. The statement has been derived from the properties of the individual components.

Toxicity to fish

Information on: Imazapyr

LC50 (96 h) >100PPM, Oncorhynchus mykiss (static)

LC50 (96 h) >100 ppm, Lepomis macrochirus (static)

Aquatic invertebrates

Information on: Imazapyr

EC50 (24 h) > 100 ppm, Daphnia magna

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Aquatic plants

Information on: Imazapyr
EC50 (96 h) >1 ppm, Selenastrum capricornutum (static)
EC50 (14 d) 24, Lemna gibba

Assessment of terrestrial toxicity

With high probability not acutely harmful to terrestrial organisms.

Other terrestrial non-mammals

Information on: imazapyr
LC50, Anas platyrhynchos
With high probability not acutely harmful to terrestrial organisms.
LD50 > 100 ug/bee, Apis mellifera
With high probability not acutely harmful to terrestrial organisms.

Persistence and degradability

Assessment biodegradation and elimination (H2O)

Information on: Imazapyr

Bioaccumulative potential

Assessment bioaccumulation potential

The product has not been tested. The statement has been derived from the properties of the individual components.

Bioaccumulation potential

Information on: Imazapyr

Bioconcentration factor: < 1.0, Lepomis macrochirus
Does not accumulate in organisms.

Mobility in soil

Assessment transport between environmental compartments

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: Imazapyr

The substance will not evaporate into the atmosphere from the water surface.
Following exposure to soil, the product trickles away and can - dependant on degradation - be transported to deeper soil areas with larger water loads.

Additional information

Other ecotoxicological advice:

The ecological data given are those of the active ingredient. Do not release untreated into natural waters.

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13. Disposal considerations

Waste disposal of substance:

Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal:

Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA:

This product is not regulated by RCRA.

14. Transport Information

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Hazard class: 9
Packing group: III
ID number: UN 3082
Hazard label: 9, EHSM
Marine pollutant: YES
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains IMAZAPYR 43%)

Air transport

IATA/ICAO

Hazard class: 9
Packing group: III
ID number: UN 3082
Hazard label: 9, EHSM
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains IMAZAPYR 43%)

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US blocked / not listed

Crop Protection TSCA, US released / listed

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EPCRA 311/312 (Hazard categories): Acute; Chronic

NFPA Hazard codes:

Health : 1 Fire: 1 Reactivity: 0 Special:

Labeling requirements under FIFRA

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 workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

CAUTION:

KEEP OUT OF REACH OF CHILDREN.

Avoid contact with the skin, eyes and clothing.

Avoid inhalation of mists/vapours.

16. Other Information

SDS Prepared by:

BASF NA Product Regulations

SDS Prepared on: 2014/12/23

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE , IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY OUR COMPANY HEREUNDER ARE GIVEN GRATIS AND WE ASSUME NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.
END OF DATA SHEET

imazamox

Target Plants: herbaceous weed control in terrestrial and aquatic settings. Used for control of Chinese tallowtree, alligatorweed, Brazilian peppertree, and control/suppression of certain submerged aquatic vegetation or applied as a broadcast or spot spray to floating and emergent vegetation

Brands: Clearcast SePro

Signal Word: **CAUTION**

Use Statement: GENERAL USE

Material Safety Data Sheet



Transportation and Medical Emergency Phone: 1-800-535-5053 (INFOTRAC)

General Phone: 317-580-8282

EPA Reg. Number: 241-437-67690

Creation Date: 03/08/2010

Clearcast® Herbicide

SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032-4565

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: Clearcast® Herbicide

Molecular Formula: C₁₅H₁₈N₃O₄.NH(4)
Chemical Family: imidazole derivative
Synonyms: ammonium salt of imazamox

COMPANY IDENTIFICATION:

SePRO Corporation
11550 North Meridian Street, Suite 600
Carmel, IN 46032-4565
www.sepro.com
Information Phone: 317-580-8282 (Mon - Fri, 8 am to 5 pm EST)

2. HAZARDS IDENTIFICATIONS

EMERGENCY OVERVIEW

CAUTION

- Harmful if absorbed through skin.
- Harmful if inhaled.
- Keep out of reach of children.
- Keep out of reach of domestic animals.
- Avoid contact with the skin, eyes and clothing.
- Avoid inhalation of mists/vapors.

See Product Label for additional precautionary statements.

State of Matter: liquid
Color: pale yellow, clear
Odor: acidic

Potential Health Effects

Primary Routes of Exposure: Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity: Relatively nontoxic after single ingestion. Slightly toxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

Irritation/Corrosion: May cause slight irritation to the skin. May cause moderate but temporary irritation to the eyes.

Potential Environmental Effects

Aquatic Toxicity: There is a high probability that the product is not acutely harmful to aquatic organisms.

Terrestrial Toxicity: With high probability not acutely harmful to terrestrial organisms.

EMERGENCY PHONE NUMBER:
1-800-535-5053

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	% by Wt.
Ammonium salt of imazamox (CAS# 247057-22-3)	12.1%

Components not precisely identified are proprietary or not hazardous.

4. FIRST AID MEASURES

General Advice: First aid providers should wear personal protective equipment to prevent exposure. Remove contaminated clothing. Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or physician for treatment advice. Have the product container or label with you when calling a poison control center or doctor or going for treatment.

If Inhaled: Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary.

If on Skin: Rinse skin immediately with plenty of water for 15 - 20 minutes.

If in Eyes: Hold eyes open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing.

If Swallowed: Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions.

Note to Physician

Antidote: No known specific antidote.

Treatment: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point & Method: Based on the high water content the determination of the flash point seems not to be necessary.

Flammable Limits: Not determined. Slightly flammable in the presence of open flames, sparks, static charge and heat.

Auto-Ignition Temperature: Not applicable.

Self-Ignition Temperature: Based on the water content the product does not ignite.

Material Safety Data Sheet



Transportation and Medical Emergency Phone: 1-800-535-5053 (INFOTRAC)

General Phone: 317-580-8282

EPA Reg. Number: 241-437-67690

Creation Date: 03/08/2010

Clearcast® Herbicide

SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032-4565

Extinguishing Media: Use foam, dry extinguishing media, carbon dioxide, water spray.

Firefighting Equipment: Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Hazards During Fire-Fighting: Carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, ammonium, hydrocarbons. If product is heated above decomposition temperature, toxic vapors will be released. The substances/groups of substances mentioned can be released if the product is involved in a fire.

Further Information: Evacuate area of all unnecessary personnel. Contain contaminated water/firefighting water. Do not allow to enter drains or waterways.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental Precautions: Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

Cleanup: Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

Report large spills to **INFOTRAC** and consult SePRO Corporation for assistance.

7. HANDLING AND STORAGE

Handling Information

General Advice: *Recommendations Are For Manufacturing, Commercial Blending, And Packaging Workers.*

Pesticide applicators & workers must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170.

- Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary).
- Keep away from sources of ignition. No smoking.
- Keep container tightly sealed.
- Protect contents from the effects of light. Protect against heat. Protect from air.
- Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible.
- Avoid aerosol formation. Avoid dust formation.
- Provide means for controlling leaks and spills.
- Do not return residues to the storage containers.
- Follow label warnings even after container is emptied. The substance/product may be handled only by appropriately trained personnel.
- Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapors.
- Wear suitable personal protective clothing and equipment.

Protection Against Fire and Explosion: The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

Storage Information

General Advice: Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

Storage Incompatibility: Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

Storage Stability: If substance/product crystallizes, thaw at room temperature.

Temperature Tolerance: Protect from temperatures below 0°C. Changes in the properties of the product may occur if substance/product is stored below indicated temperature for extended periods of time. Protect from temperatures above 40°C. Changes in the

Material Safety Data Sheet



Transportation and Medical Emergency Phone: 1-800-535-5053 (INFOTRAC)

General Phone: 317-580-8282

EPA Reg. Number: 241-437-67690

Creation Date: 03/08/2010

Clearcast® Herbicide

SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032-4565

properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Advice on System Design: Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal Protective Equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS

Respiratory Protection: Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and vapors. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facemask pressure demand self-contained breathing apparatus (SCBA) or a full facemask pressure demand supplied-air respirator (SAR) with escape provisions.

Hand Protection: Chemical resistant protective gloves. Protective glove selection must be based on the user's assessment of the workplace hazards.

Eye Protection: Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body Protection: Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General Safety and Hygiene Measures

- Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment.
- Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice.
- Personal protective equipment should be decontaminated prior to reuse.

- Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks).
- Take off immediately all contaminated clothing. Store work clothing separately.
- Hands and/or face should be washed before breaks and at the end of the shift.
- No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: liquid

Odor: acidic, mild

Color: pale yellow, clear

pH Value: 6.0 - 6.1

Freezing Point: approximately 0°C (1,013.3 hPa) [Information applies to the solvent.]

Boiling Point: approximately 100°C (1,013.3 hPa) [Information applies to the solvent.]

Vapor Pressure: approximately 23.3 hPa (20°C) [Information applies to the solvent.]

Density: 1.0486 g/cm³ (20°C)

Relative Density: 1.05

Bulk Density: not applicable

Partitioning coefficient n-octanol/ water (log Pow): not applicable

Viscosity, dynamic: 3.7 mPa.s

Molar Mass: 322.4 g/mol

10. STABILITY AND REACTIVITY

Stability: The product is chemically stable. No hazardous reactions if stored and handled as prescribed/indicated.

Incompatibility (specific conditions/materials to avoid): Oxidizing agents.

Hazardous Decomposition Products: No hazardous decomposition products if stored and handled as prescribed/indicated. Prolonged thermal loading can result in products of degradation being given off.

Thermal Decomposition: Possible thermal decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, ammonium, hydrocarbons. Stable at ambient temperature. If product is heated above decomposition temperature toxic vapors/hazardous fumes may be released.

Corrosion to Metals: Corrosive effects to metal are not anticipated.

Oxidizing Properties: Not an oxidizer.

Material Safety Data Sheet



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11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral (LD₅₀, rat): >5,000 mg/kg

Inhalation (LC₅₀, rat - 4 hr): >5 mg/l

Dermal (LD₅₀, rat): >4,000 mg/kg

Irritation/Corrosion

Skin (rabbit): Non-irritant

Eye (rabbit): Non-irritant

Sensitization (guinea pig): Modified Buehler test. Skin sensitizing effects were not observed in animal studies.

The below information is on the active ingredient, imazamox.

Genetic Toxicity: No mutagenic effect was found in various tests with microorganisms and mammals.

Carcinogenicity: In long-term studies in rats and mice in which the substance was given by feed, a carcinogenic effect was not observed.

Reproductive Toxicity: The results of animal studies gave no indication of a fertility impairing effect.

Development: No indications of a developmental toxic/teratogenic effect were seen in animal studies.

12. ENVIRONMENTAL INFORMATION

The below information is on the active ingredient, imazamox.

Fish Acute LC₅₀ (96 hr): *Oncorhynchus mykiss* ≥122 ppm

Aquatic Invertebrate Acute EC₅₀: *Daphnia magna* >122 ppm

Aquatic Plant EC₅₀ (120 hr): Algae > 0.037 mg/l

Other Terrestrial Non-Mammals:

Mallard duck LC₅₀: >5,572 ppm

Honey bee LC₅₀: >100 ug/bee

Degradability/Persistence/Biological/Abiological Degradation: Not readily biodegradable (by OECD criteria).

13. DISPOSAL CONSIDERATIONS

Waste Disposal of Substance: Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA: This product is not regulated by RCRA.

14. TRANSPORT INFORMATION

DOT: Not regulated.

15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. Regulations

Registration Status:

Chemical TSCA: US blocked / not listed

Crop Protection TSCA: US released / exempt

OSHA Hazard Category: Not hazardous

EPCRA 311/312 (Hazard Categories): Not hazardous

State Regulations

CA Prop. 65: There are no listed chemicals in this product.

16. OTHER INFORMATION

MSDS STATUS: Creation Date – 03/08/2010
(BASF090409)

The information in this Material Safety Data Sheet relates to this specific material. It may not be valid for this material if used in combination with any other materials or in any process. It is the users' responsibility to satisfy themselves as to the suitability and completeness of this information for their own particular use.

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESS OR IMPLIED, IS MADE. CONSULT SEPRO CORPORATION FOR FURTHER INFORMATION.

indaziflam

Target Plants: New mode of action provides superior efficacy even on hard to control grassy and resistant broadleaf weeds

Broadleaf weeds: Kochia, horseweed/marestail, pigweed, Russian thistle, yellow starthistle and more

Grassy weeds: Annual bromegrass, Barnyardgrass, crabgrass, foxtails, goosegrass, sprangletop, tufted lovegrass, annual sedges and more

Resistant Plants: Emerged plants

Note: Pre-emergent use product. Essentially ineffective if soil disturbance occurs after application

Brands: Esplanade F, Marengo

Signal Word: **CAUTION**

Use Statement: GENERAL USE



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Version 2 / USA
102000023686

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Revision Date: 02/03/2014
Print Date: 03/11/2016

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name	ESPLANADE F HERBICIDE
Product code (UVP)	79930208
SDS Number	102000023686
EPA Registration No.	432-1517

Relevant identified uses of the substance or mixture and uses advised against

Use	Herbicide
Restrictions on use	See product label for restrictions.

Information on manufacturer

Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
United States

Emergency telephone no.

All Emergencies, 24hr/ 7 days 1-800-334-7577

Product Information

Telephone No.

SDS Information or Request SDSINFO.BCS-NA@bayer.com

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Specific target organ toxicity - repeated exposure : Category 2



Signal word: Warning

Hazard statements

May cause damage to organs (nervous system) through prolonged or repeated exposure.

Precautionary statements

Do not breathe spray.
Get medical advice/attention if you feel unwell.
Dispose of contents/container in accordance with local regulation.

Other hazards

No other hazards known.



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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Average % by Weight
Indaziflam	950782-86-2	19.05
1,2-Propanediol	57-55-6	8.00

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. 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. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms	No symptoms known or expected.
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Indication of any immediate medical attention and special treatment needed

Treatment	Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.
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SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable	High volume water jet



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Special hazards arising from the substance or mixture	In the event of fire the following may be released: Hydrogen cyanide (hydrocyanic acid), Hydrogen fluoride, Carbon monoxide (CO), Nitrogen oxides (NOx)
Advice for firefighters	
Special protective equipment for fire-fighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point	> 100 °C Not relevant; aqueous solution
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Explosivity	not applicable

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling



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Advice on safe handling	Handle and open container in a manner as to prevent spillage. Maintain exposure levels below the exposure limit through the use of general and local exhaust ventilation.
Advice on protection against fire and explosion	No special precautions required.
Hygiene measures	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics. Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.
Conditions for safe storage, including any incompatibilities	
Requirements for storage areas and containers	Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Protect from freezing.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
Indaziflam	950782-86-2	0.14 mg/m3 (TWA)		OES BCS*
1,2-Propanediol (Aerosol.)	57-55-6	10 mg/m3 (TWA)	2010	WEEL
1,2-Propanediol	57-55-6	1000 ug/m3 (ST ESL)	03 2012	TX ESL
1,2-Propanediol	57-55-6	50 ug/m3 (ST ESL)	03 2012	TX ESL
1,2-Propanediol	57-55-6	100 ug/m3 (AN ESL)	03 2012	TX ESL
1,2-Propanediol	57-55-6	50 ppb (AN ESL)	03 2012	TX ESL
1,2-Propanediol	57-55-6	500 ppb (ST ESL)	03 2012	TX ESL
1,2-Propanediol	57-55-6	5 ug/m3 (AN ESL)	03 2012	TX ESL

*OES BCS: Internal Bayer CropScience "Occupational Exposure Standard"

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.



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Respiratory protection	When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.
Hand protection	Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton)
Eye protection	Safety glasses with side-shields
Skin and body protection	Wear long-sleeved shirt and long pants and shoes plus socks.
General protective measures	Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white
Physical State	suspension
Odor	characteristic
Odour Threshold	no data available
pH	7.0 - 8.5 (1 %) at 23 °C
Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Density	ca. 1.05 g/cm ³ at 20 °C
Evaporation rate	no data available
Boiling Point	no data available
Melting / Freezing Point	no data available
Water solubility	dispersible
Minimum Ignition Energy	not applicable
Decomposition temperature	Stable under normal conditions.



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Partition coefficient: n-octanol/water	no data available
Viscosity	35 - 80 mPa.s at 20 °C Velocity gradient 100 /s
Flash point	> 100 °C Not relevant; aqueous solution
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Explosivity	not applicable
Other information	Further safety related physical-chemical data are not known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition	Stable under normal conditions.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Conditions to avoid	Extremes of temperature and direct sunlight.
Incompatible materials	Store only in the original container.
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Eye contact, Inhalation, Skin Absorption, Ingestion
Immediate Effects	
Skin	Harmful if absorbed through skin.



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Ingestion Harmful if swallowed.

Inhalation Harmful if inhaled.

Information on toxicological effects

Acute oral toxicity LD50 (rat) \geq 5,000 mg/kg

Acute inhalation toxicity LC50 (rabbit) > 3.624 mg/l
Exposure time: 4 h
Determined in the form of a respirable aerosol.
Highest attainable concentration.

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

Skin irritation No skin irritation (rabbit)

Eye irritation No eye irritation (rabbit)

Sensitisation Non-sensitizing. (guinea pig)
OECD Test Guideline 406, Buehler test

Assessment repeated dose toxicity

Indaziflam caused neurobehavioral effects and/or neuropathological changes in subchronic studies in rats and dogs.

Assessment Mutagenicity

Indaziflam was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Assessment Carcinogenicity

Indaziflam was not carcinogenic in lifetime feeding studies in rats and mice.

ACGIH

None.

NTP

None.

IARC

None.

OSHA

None.

Assessment toxicity to reproduction

Indaziflam caused reproduction toxicity in a two-generation study in rats only at dose levels also toxic to the parent animals. The reproduction toxicity seen with Indaziflam is related to parental toxicity.

Assessment developmental toxicity

Indaziflam did not cause developmental toxicity in rats and rabbits.



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Further information

Acute toxicity studies have not been performed on this product as formulated.
Acute toxicity studies have been bridged from a similar formulation(s).
The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to aquatic invertebrates	EC50 (Water flea (Daphnia magna)) 149 mg/l Exposure time: 48 h
Toxicity to aquatic plants	EC50 (Pseudokirchneriella subcapitata) 0.75 mg/l Exposure time: 72 h
Biodegradability	Indaziflam: not rapidly biodegradable
Koc	Indaziflam: Koc:496
Bioaccumulation	Indaziflam: Bioconcentration factor (BCF) 66 Does not bioaccumulate.
Mobility in soil	Indaziflam: Moderately mobile in soils
Additional ecological information	No other effects to be mentioned.
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent sites. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	Do not contaminate water, food, or feed by disposal. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
Contaminated packaging	Do not re-use empty containers. Triple rinse containers.



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Puncture container to avoid re-use.
Dispose of empty container in a sanitary landfill or by incineration,
or, if allowed by State/Provincial and local authorities, by burning.
If burned, stay out of smoke.
Follow advice on product label and/or leaflet.

RCRA Information

Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR	Not dangerous goods / not hazardous material
IMDG	
UN number	3082
Class	9
Packaging group	III
Marine pollutant	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (INDAZIFLAM SOLUTION)
IATA	
UN number	3082
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (INDAZIFLAM SOLUTION)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No.	432-1517
US Federal Regulations	
TSCA list	
1,2-Propanediol	57-55-6
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)	
None.	
SARA Title III - Section 302 - Notification and Information	
None.	



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SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

1,2-Propanediol	57-55-6	MN, RI
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Canadian Regulations

Canadian Domestic Substance List

1,2-Propanediol	57-55-6
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Environmental

CERCLA

None.

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

International Regulations

European Inventory of Existing Commercial Substances (EINECS)

1,2-Propanediol	57-55-6
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EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Harmful if swallowed, inhaled or absorbed through the skin.
Avoid contact with skin, eyes and clothing.
Avoid breathing spray mist.

SECTION 16: OTHER INFORMATION

NFPA 704 (National Fire Protection Association):

Health - 1 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Bayer Environmental Science
SAFETY DATA SHEET



ESPLANADE F HERBICIDE

Version 2 / USA
102000023686

11/11
Revision Date: 02/03/2014
Print Date: 03/11/2016

Reason for Revision: Revised according to the current OSHA Hazard Communication Standard (29CFR1910.1200)

Revision Date: 02/03/2014

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

metsulfuron methyl

Target Plants: Used as a selective pre- and postemergence herbicide for broadleaf weeds and some annual grasses. Many annual and perennial weeds and woody plants esp. kudzu and multiflora rose.

Resistant Plants: Grasses, yellow poplar, loblolly pine

Brands: Escort XP, MSM 60DF, Patriot

Signal Word: **CAUTION**

Use Statement: GENERAL USE



ESCORT® XP HERBICIDE

Version 1.0 / USA
102000030324

1/10
Revision Date: 06/16/2015
Print Date: 06/17/2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name ESCORT® XP HERBICIDE

Product code (UVP) 84100846

SDS Number 102000030324

EPA Registration No. 432-1549

Relevant identified uses of the substance or mixture and uses advised against

Use Herbicide

Restrictions on use See product label for restrictions.

Information on supplier

Supplier Bayer CropScience
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
United States

Responsible Department Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days) 1-800-334-7577

Product Information Telephone Number 1-866-99BAYER (1-866-992-2937)

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards

No particular hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Metsulfuron-methyl	74223-64-6	60.0
Sulfonated aromatic polymer, sodium salt	68425-94-5	3.2



ESCORT® XP HERBICIDE

Version 1.0 / USA
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Revision Date: 06/16/2015
Print Date: 06/17/2015

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. 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. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms To date no symptoms are known.

Indication of any immediate medical attention and special treatment needed

Treatment Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable	High volume water jet

Special hazards arising from the substance or mixture Dangerous gases are evolved in the event of a fire.

Advice for firefighters

Special protective equipment for fire-fighters Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

Further information Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Whenever possible, contain fire-fighting water by diking area with sand or earth.



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Flash point	not applicable
Autoignition temperature	> 400 °C / > 752 °F
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations. Contaminated soil may have to be removed and disposed.

Additional advice Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Ensure adequate ventilation. Handle and open container in a manner as to prevent spillage.

Hygiene measures Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities



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Requirements for storage areas and containers

Keep containers tightly closed in a dry, cool and well-ventilated place. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
Sucrose	57-50-1	10 mg/m ³ (TWA)	02 2012	ACGIH
Sucrose (Respirable.)	57-50-1	5 mg/m ³ (REL)	2010	NIOSH
Sucrose (Total)	57-50-1	10 mg/m ³ (REL)	2010	NIOSH
Sucrose (Total dust.)	57-50-1	15 mg/m ³ (PEL)	02 2006	OSHA Z1
Sucrose (Respirable fraction.)	57-50-1	5 mg/m ³ (PEL)	02 2006	OSHA Z1
Sucrose (Respirable fraction.)	57-50-1	5 mg/m ³ (TWA)	1989	OSHA Z1A
Sucrose (Total dust.)	57-50-1	15 mg/m ³ (TWA)	1989	OSHA Z1A
Sucrose (Respirable fraction.)	57-50-1	5 mg/m ³ (TWA)	06 2008	TN OEL
Sucrose (Total dust.)	57-50-1	15 mg/m ³ (TWA)	06 2008	TN OEL
Sucrose (Particulate.)	57-50-1	5ug/m ³ (AN ESL)	02 2013	TX ESL
Sucrose (Particulate.)	57-50-1	50ug/m ³ (ST ESL)	02 2013	TX ESL

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection

When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection

Chemical resistant nitrile rubber gloves

Eye protection

Safety glasses with side-shields

Skin and body protection

Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures

Follow manufacturer's instructions for cleaning/maintaining PPE. If



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no such instructions for washables, use detergent and warm/tepid water.

Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	light brown
Physical State	granular
Odor	slight
Odour Threshold	no data available
pH	5.0 at 1 % (as aqueous solution)
Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Bulk density	690 kg/m ³ (bulk density tapped)
Evaporation rate	not applicable
Boiling Point	not applicable
Melting / Freezing Point	not applicable
Water solubility	dispersible
Minimum Ignition Energy	no data available
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	not applicable
Viscosity	not applicable
Flash point	not applicable
Autoignition temperature	> 400 °C / > 752 °F
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available



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SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition	no data available
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Conditions to avoid	no data available
Incompatible materials	no data available
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes Eye contact, Inhalation, Ingestion, Skin contact

Immediate Effects

Eye Causes eye irritation.

Information on toxicological effects

Acute oral toxicity	LD50 (rat) > 5,000 mg/kg
Acute inhalation toxicity	LC50 (rat) > 5.0 mg/l Exposure time: 4 h The value mentioned relates to the active ingredient metsulfuron methyl.
Acute dermal toxicity	LD50 (rabbit) > 5,000 mg/kg
Skin irritation	No skin irritation (rabbit)
Eye irritation	Slight irritation (rabbit)
Sensitisation	Non-sensitizing. (guinea pig) OECD Test Guideline 406, Buehler test

ACGIH

None.

NTP

None.

IARC

None.

OSHA

None.



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Further information

Only acute toxicity studies have been performed on the formulated product.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) > 150 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient metsulfuron methyl. LC50 (Lepomis macrochirus (Bluegill sunfish)) > 150 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic invertebrates	EC50 (Daphnia (water flea)) > 120 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic plants	EC50 (Anabaena flos-aquae (cyanobacterium)) 0.066 mg/l Exposure time: 72 h The value mentioned relates to the active ingredient metsulfuron methyl. EC50 (Lemna minor (Common duck-weed)) 0.00036 mg/l Exposure time: 14 d The value mentioned relates to the active ingredient metsulfuron methyl.
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	Do not contaminate water, food, or feed by disposal. Dispose of unused product by incineration at a licensed incineration plant, in accordance with all applicable national and local regulations.
Contaminated packaging	Consult state and local regulations regarding the proper disposal of container. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.



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SECTION 14: TRANSPORT INFORMATION

49CFR Not dangerous goods / not hazardous material

IMDG

UN number **3077**
Class 9
Packaging group III
Marine pollutant YES
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S.
(METSULFURON-METHYL MIXTURE)

IATA

UN number **3077**
Class 9
Packaging group III
Environm. Hazardous Mark YES
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S.
(METSULFURON-METHYL MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1549

US Federal Regulations

TSCA list

Sulfonated aromatic polymer, sodium salt 68425-94-5

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

None.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

None.

Canadian Regulations



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Canadian Domestic Substance List

None.

Environmental

CERCLA

None.

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Causes eye irritation.
Avoid breathing dust or spray mist.
Avoid contact with skin, eyes and clothing.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
CAS-Nr.	Chemical Abstracts Service number
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	US. IARC Monographs on Occupational Exposures to Chemical Agents
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation



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NFPA 704 (National Fire Protection Association):

Health - 1 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Safety Data Sheet.

Revision Date: 06/16/2015

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

oxyfluorfen

Target Plants: Pre and post emergent control of broadleaf weeds and certain grasses.

Resistant Plants: Certain conifers and deciduous species.

Brands: Goal 2XL

Signal Word: **WARNING**

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: GOAL™ 2XL Herbicide

Issue Date: 08/16/2016

Print Date: 08/16/2016

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: GOAL™ 2XL Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Skin irritation - Category 2

Eye irritation - Category 2A

Skin sensitisation - Sub-category 1B

Carcinogenicity - Category 2

Reproductive toxicity - Category 1B

Specific target organ toxicity - single exposure - Category 3

Aspiration hazard - Category 1

Label elements

Hazard pictograms



Signal word: **DANGER!**

Hazards

May be fatal if swallowed and enters airways.

Causes skin irritation.

May cause an allergic skin reaction.

Causes serious eye irritation.

May cause respiratory irritation.

Suspected of causing cancer.

May damage fertility or the unborn child.

Precautionary statements

Prevention

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

Wash skin thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Contaminated work clothing should not be allowed out of the workplace.

Wear eye protection/ face protection.

Wear protective gloves.

Use personal protective equipment as required.

Response

IF SWALLOWED: Immediately call a POISON CENTER/doctor.

IF ON SKIN: Wash with plenty of soap and water.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF exposed or concerned: Get medical advice/ attention.

Do NOT induce vomiting.

If skin irritation or rash occurs: Get medical advice/ attention.

If eye irritation persists: Get medical advice/ attention.

Take off contaminated clothing and wash before reuse.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Oxyfluorfen	42874-03-3	22.3%
Solvent naphtha (petroleum), heavy aromatic	64742-94-5	57.5%
2-Methylnaphthalene	91-57-6	15.0%
N-Methyl-2-pyrrolidone	872-50-4	10.0%
Calcium dodecylbenzene sulfonate	26264-06-2	9.1%
Naphthalene	91-20-3	8.6%
1-Methylnaphthalene	90-12-0	7.2%
Isobutanol	78-83-1	1.5%

4. FIRST AID MEASURES

Description of first aid measures

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

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

Skin contact: Take off contaminated clothing. 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.

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 immediately available.

Ingestion: Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and

special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. If burn is present, treat as any thermal burn, after decontamination. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Administer 100% oxygen to relieve headache and a general sense of weakness. Determine methemoglobin concentration of blood every 3 to 6 hours for first 24 hours. It should return to normal within 24 hours. The treatment of toxic methemoglobinemia may include the intravenous administration of methylene blue. If methemoglobin >10-20% consider methylene blue 1-2 mg/kg body weight as 1% solution intravenously over 5 minutes followed by 15-30 cc flush (Price D, Methemoglobinemia, Goldfrank Toxicologic Emergencies, 5th ed., 1994). Also provide 100% oxygen. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Repeated excessive exposure may aggravate preexisting lung disease. Skin contact may aggravate preexisting dermatitis.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

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: Nitrogen oxides. Hydrogen fluoride. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers,

boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Keep upwind of spill. Keep personnel out of low areas. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Oxyfluorfen	Dow IHG	TWA	0.2 mg/m ³
Solvent naphtha (petroleum), heavy aromatic	Dow IHG	TWA	100 mg/m ³
2-Methylnaphthalene	Dow IHG	STEL	300 mg/m ³
	ACGIH	TWA	0.5 ppm
N-Methyl-2-pyrrolidone	US WEEL	TWA	10 ppm
	CAL PEL	PEL	4 mg/m ³ 1 ppm
	US WEEL	TWA	SKIN
	Dow IHG	TWA	10 ppm
Naphthalene	Dow IHG	TWA	SKIN
	Dow IHG	STEL	15 ppm
	Dow IHG	STEL	SKIN
	Dow IHG	STEL	SKIN

	ACGIH	TWA	10 ppm
	ACGIH	TWA	SKIN
	OSHA Z-1	TWA	50 mg/m3 10 ppm
	CAL PEL	PEL	0.5 mg/m3 0.1 ppm
1-Methylnaphthalene	ACGIH	TWA	0.5 ppm
Isobutanol	Dow IHG	TWA	50 ppm
	Dow IHG	STEL	75 ppm
	ACGIH	TWA	50 ppm
	OSHA Z-1	TWA	300 mg/m3 100 ppm
	OSHA P0	TWA	150 mg/m3 50 ppm
	CAL PEL	PEL	150 mg/m3 50 ppm

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

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

Other 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.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow to brown
Odor	Sweet
Odor Threshold	No data available
pH	7.22 <i>pH Electrode</i>
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	201.7 °C (395.1 °F)
Flash point	closed cup 98 °C (208 °F) <i>Setaflash Closed Cup ASTM D3828</i>
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Flammable liquid
Lower explosion limit	1.3 % vol Solvent
Upper explosion limit	11.8 % vol Solvent
Vapor Pressure	0.29 hPa at 20 °C (68 °F)
Relative Vapor Density (air = 1)	5.2
Relative Density (water = 1)	1.077 at 20 °C (68 °F) <i>Digital Density Meter (Oscillating Coil)</i>
Water solubility	emulsifiable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	346 °C (655 °F)
Decomposition temperature	290 °C (554 °F)
Dynamic Viscosity	5.9 mPa.s at 39.9 °C (103.8 °F)
Kinematic Viscosity	No data available
Explosive properties	No
Oxidizing properties	yes
Liquid Density	1.077 g/cm ³ at 20 °C (68 °F) <i>Digital density meter</i>
Molecular weight	No data available

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Some components of this product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with: Acids. Amines. Bases. Halogens.

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 monoxide. Carbon dioxide. Hydrogen chloride. Hydrogen fluoride. Nitrogen oxides. Toxic gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, Rat, female, 3,129 mg/kg

Acute dermal toxicity

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

As product:

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

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to mist. Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs.

As product:

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.12 mg/l OECD Test Guideline 403 No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact may cause severe skin irritation with pain and local redness.

May cause drying and flaking of the skin.

Prolonged contact may cause skin irritation, even a burn.

Serious eye damage/eye irritation

May cause moderate eye irritation which may be slow to heal.

May cause slight corneal injury.

Sensitization

Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause respiratory irritation.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

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

Liver.
Blood.
Spleen.

For the major component(s):

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

Gastrointestinal tract.
Thyroid.
Urinary tract.
Lung.

Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

For the minor component(s):

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

Blood-forming organs (Bone marrow & Spleen).
Central nervous system.
Liver.

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.

Carcinogenicity

Contains naphthalene which 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.

For the active ingredient(s): An increase in spontaneously occurring tumors observed in mice is of questionable relevance. No increases in tumors were observed in rats.

Teratogenicity

For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

For the solvent(s): Did not cause birth defects or any other fetal effects in laboratory animals.

N-methyl pyrrolidone has caused toxic effects to the fetus in laboratory animals at high dose levels with either mild or undetectable maternal toxicity.

Reproductive toxicity

For the active ingredient(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Based on information for component(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Carcinogenicity Component	List	Classification
Naphthalene	IARC	Group 2B: Possibly carcinogenic to humans
	US NTP	Reasonably anticipated to be a human carcinogen
	ACGIH	A3: Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

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

Toxicity

Oxyfluorfen

Acute toxicity to fish

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50, Rainbow trout (*Oncorhynchus mykiss*), static test, 96 Hour, 0.25 mg/l

Acute toxicity to aquatic invertebrates

EC50, water flea *Daphnia magna*, 48 Hour, 0.072 mg/l

Acute toxicity to algae/aquatic plants

EbC50, diatom *Navicula* sp., static test, 96 Hour, Biomass, 0.031 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, *Pimephales promelas* (fathead minnow), flow-through test, 33 d, survival, 0.038 mg/l

NOEC, *Pimephales promelas* (fathead minnow), flow-through test, 265 d, survival, 0.005 mg/l

NOEC, *Cyprinodon variegatus* (sheepshead minnow), flow-through test, 34 d, growth, 0.0047 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, water flea *Daphnia magna*, flow-through test, 21 d, 0.013 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

LD50, *Colinus virginianus* (Bobwhite quail), > 2,150 mg/kg

LC50, *Anas platyrhynchos* (Mallard duck), 8 d, > 5,000 mg/kg

oral LD50, *Apis mellifera* (bees), 48 Hour, > 100micrograms/bee

contact LD50, *Apis mellifera* (bees), 48 Hour, > 100.0micrograms/bee

dietary LC50, *Colinus virginianus* (Bobwhite quail), > 5,000 mg/kg

Solvent naphtha (petroleum), heavy aromatic

Acute toxicity to fish

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), static test, 96 Hour, 3.0 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 1.1 mg/l

Acute toxicity to algae/aquatic plants

EC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, 7.9 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia pulex (Water flea), 21 d, mortality, 5.2 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

dietary LC50, Colinus virginianus (Bobwhite quail), 5 d, > 6,500 ppm

oral LD50, Colinus virginianus (Bobwhite quail), > 2,250 mg/kg

2-Methylnaphthalene**Acute toxicity to fish**

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), 96 Hour, 1.5 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 1.5 mg/l

N-Methyl-2-pyrrolidone**Acute toxicity to fish**

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), static test, 96 Hour, > 5,000 mg/l

LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 1,072 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, > 500 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, 12.5 mg/l

Calcium dodecylbenzene sulfonate**Acute toxicity to fish**

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, Cyprinus carpio (Carp), 96 Hour, 2.8 - 4.2 mg/l, Method Not Specified.

LC50, Oryzias latipes (Orange-red killifish), 48 Hour, 3.0 - 5.3 mg/l, Method Not Specified.

Naphthalene**Acute toxicity to fish**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, 0.11 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 1.6 - 24.1 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Skeletonema costatum (marine diatom), Growth rate inhibition, 72 Hour, 0.4 mg/l

Chronic toxicity to fish

NOEC, Other, flow-through, 40 d, mortality, 0.37 mg/l

1-Methylnaphthalene

Acute toxicity to fish

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, Pimephales promelas (fathead minnow), 96 Hour, 9 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 1.2 - 1.4 mg/l

Isobutanol

Acute toxicity to fish

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

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 1,430 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia pulex (Water flea), static test, 48 Hour, 1,100 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, 1,799 mg/l

Toxicity to bacteria

IC50, activated sludge, static test, 16 Hour, Growth inhibition, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 20 mg/l

MATC (Maximum Acceptable Toxicant Level), Daphnia magna (Water flea), 21 d, number of offspring, 28 mg/l

Persistence and degradability

Oxyfluorfen

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

Theoretical Oxygen Demand: 1.305 mg/mg

Stability in Water (1/2-life)

Hydrolysis, 3.9 d, pH 5 - 9, Half-life Temperature 20 °C

Solvent naphtha (petroleum), heavy aromatic

Biodegradability: Biodegradation may occur under aerobic conditions (in the presence of oxygen). Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Fail

Biodegradation: 30 - 41 %

Exposure time: 28 d

Method: OECD Test Guideline 301D or Equivalent

2-Methylnaphthalene

Biodegradability: Expected to degrade slowly in the environment.

N-Methyl-2-pyrrolidone

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

10-day Window: Pass

Biodegradation: 91 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

10-day Window: Not applicable

Biodegradation: 73 %

Exposure time: 28 d

Method: OECD Test Guideline 301C or Equivalent

10-day Window: Not applicable

Biodegradation: > 90 %

Exposure time: 8 d

Method: OECD Test Guideline 302B or Equivalent

Theoretical Oxygen Demand: 2.58 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 0.486 d

Method: Estimated.

Calcium dodecylbenzene sulfonate

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

10-day Window: Pass

Biodegradation: 95 %

Exposure time: 28 d

Method: OECD Test Guideline 301E or Equivalent

Naphthalene

Biodegradability: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

Theoretical Oxygen Demand: 3.00 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	57.000 %
10 d	71.000 %
20 d	71.000 %

Photodegradation**Test Type:** Half-life (indirect photolysis)**Sensitizer:** OH radicals**Atmospheric half-life:** 5.9 Hour**Method:** Estimated.**1-Methylnaphthalene****Biodegradability:** Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

10-day Window: Not applicable

Biodegradation: 0 - 2 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301C or Equivalent**Isobutanol****Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 70 - 80 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301D or Equivalent

10-day Window: Not applicable

Biodegradation: 90 %**Exposure time:** 14 d**Method:** OECD Test Guideline 301C or Equivalent**Theoretical Oxygen Demand:** 2.59 mg/mg Estimated.**Chemical Oxygen Demand:** 2.29 mg/mg Dichromate**Biological oxygen demand (BOD)**

Incubation Time	BOD
5 d	64 - 69 %
10 d	73 - 79 %
20 d	72 - 81 %

Photodegradation**Test Type:** Half-life (indirect photolysis)**Sensitizer:** OH radicals**Atmospheric half-life:** 1.55 d**Method:** Estimated.**Bioaccumulative potential**

Oxyfluorfen

Bioconcentration factor (BCF): 184 - 1,151 Lepomis macrochirus (Bluegill sunfish) 168 Hour

Solvent naphtha (petroleum), heavy aromatic

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

Partition coefficient: n-octanol/water(log Pow): 2.9 - 6.1 Measured

Bioconcentration factor (BCF): 61 - 159 Fish

2-Methylnaphthalene

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.86 Estimated.

N-Methyl-2-pyrrolidone

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

Partition coefficient: n-octanol/water(log Pow): -0.38 Measured

Calcium dodecylbenzene sulfonate

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

Partition coefficient: n-octanol/water(log Pow): 6.78 estimated

Naphthalene

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.3 Measured

Bioconcentration factor (BCF): 40 - 300 Fish 28 d Measured

1-Methylnaphthalene

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.87 Estimated.

Isobutanol

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

Partition coefficient: n-octanol/water(log Pow): 0.76 Measured

Bioconcentration factor (BCF): 2 Estimated.

Mobility in soil**Oxyfluorfen**

Expected to be relatively immobile in soil (Koc > 5000).

Partition coefficient (Koc): 6831

Solvent naphtha (petroleum), heavy aromatic

No data available.

2-Methylnaphthalene

No relevant data found.

N-Methyl-2-pyrrolidone

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.
Partition coefficient (Koc): 21 Estimated.

Calcium dodecylbenzene sulfonate

No relevant data found.

Naphthalene

Potential for mobility in soil is medium (Koc between 150 and 500).
Partition coefficient (Koc): 240 - 1300 Measured

Isobutanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 2 Estimated.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(Naphthalene, Calcium dodecylbenzene sulfonate)
UN number	UN 3082
Class	9
Packing group	III
Reportable Quantity	Naphthalene, Calcium dodecylbenzene sulfonate

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Oxyfluorfen, Naphthalene)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	Oxyfluorfen, Naphthalene
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(Oxyfluorfen, Naphthalene)
UN number	UN 3082
Class	9
Packing group	III

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components	CASRN
Oxyfluorfen	42874-03-3
N-Methyl-2-pyrrolidone	872-50-4
Naphthalene	91-20-3

Pennsylvania Worker and Community Right-To-Know Act:

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
N-Methyl-2-pyrrolidone	872-50-4
Calcium dodecylbenzene sulfonate	26264-06-2
Naphthalene	91-20-3
1-Methylnaphthalene	90-12-0
Isobutanol	78-83-1

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause birth defects or other reproductive harm.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-424

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 skin irritation

Causes moderate eye irritation

Harmful or fatal if swallowed or absorbed through the skin

16. OTHER INFORMATION**Hazard Rating System****NFPA**

Health	Fire	Reactivity
2	1	0

Revision

Identification Number: 101223292 / A211 / Issue Date: 08/16/2016 / Version: 7.1

DAS Code: GF-1243

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Dow IHG	Dow Industrial Hygiene Guideline
OSHA P0	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
PEL	Permissible exposure limit
SKIN	Absorbed via skin
STEL	Short term exposure limit
TWA	Time weighted average
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

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.

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

picloram

Target Plants: Annual, biennial, and perennial broadleaf plants and woody plants especially conifers.

Resistant Plants: Most grasses are resistant.

Brands: Tordon 22K, Picloram 22K

Signal Word: **CAUTION**

Use Statement: **RESTRICTED USE**
(on at least one product)

Product Name: TORDON* 22K Herbicide

Revision Date: 2012/11/30
Print Date: 30 Nov 2012

Dow AgroSciences Limited encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

Section 1. Identification of the substance/preparation and of the company/undertaking

1.1 Product identifiers

Product Name

TORDON* 22K Herbicide

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Plant Protection Product

1.3 Details of the supplier of the safety data sheet

COMPANY IDENTIFICATION

Dow AgroSciences Limited
A Subsidiary of The Dow Chemical Company
Latchmore Court, Brand Street
SG5 1NH Hitchin
United Kingdom

SDSQuestion@dow.com

1.4 EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

0031 115 694 982

Local Emergency Contact:

00 31 115 69 4982

Section 2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to EU Directives 67/548/EEC or 1999/45/EC

R43 May cause sensitization by skin contact.

2.2 Label elements

Labelling according to EC Directives

Hazard Symbol:

Xi - Irritant.
N - Dangerous for the environment.

Risk Phrases :

R43 - May cause sensitization by skin contact.

Safety Phrases :

S2 - Keep out of the reach of children.

S24 - Avoid contact with skin.

S37 - Wear suitable gloves.

S35 - This material and its container must be disposed of in a safe way.

S57 - Use appropriate container to avoid environmental contamination.

To avoid risks to man and the environment, comply with the instructions for use.

2.3 Other Hazards

No information available.

Section 3. Composition/information on ingredients**3.2 Mixture**

This product is a mixture.

CAS-No. / EC-No. / Index	REACH No.	Amount	Component	Classification: REGULATION (EC) No 1272/2008
CAS-No. 2545-60-0 EC-No. 219-829-6	—	24.0 %	Picloram Potassium Salt	Aquatic Chronic, 3, H412
CAS-No. 69029-39-6 EC-No. Polymer	—	< 5.0 %	Alkylphenol alkoxylate	Eye cor/irr, 2, H319 Aquatic Chronic, 2, H411
CAS-No. 1310-58-3 EC-No. 215-181-3 Index 019-002-00-8	—	< 5.0 %	Potassium hydroxide; caustic potash	Acute Tox., 4, H302 Skin cor/irr, 1A, H314

CAS-No. / EC-No. / Index	Amount	Component	Classification: 67/548/EEC
CAS-No. 2545-60-0 EC-No. 219-829-6	24.0 %	Picloram Potassium Salt	R52/53
CAS-No. 69029-39-6 EC-No. Polymer	< 5.0 %	Alkylphenol alkoxylate	Xi: R36; N: R51, R53
CAS-No. 1310-58-3 EC-No. 215-181-3 Index	< 5.0 %	Potassium hydroxide; caustic potash	Xn: R22; C: R35

II 019-002-00-8

For the full text of the H-Statements mentioned in this Section, see Section 16.
See Section 16 for full text of R-phrases.

Section 4. First-aid measures

4.1 Description of first aid measures

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

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

Skin Contact: Take off contaminated clothing. 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.

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 work area.

Ingestion: 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.

4.2 Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

4.3 Indication of immediate medical attention and special treatment needed

No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

Section 5. Fire Fighting Measures

5.1 Extinguishing Media

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

5.2 Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

5.3 Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Section 6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures: No smoking in area. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

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

Section 7. Handling and Storage

7.1 Precautions for safe handling

Handling

General Handling: Keep out of reach of children. Keep away from heat, sparks and flame. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Use with adequate ventilation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

7.2 Conditions for safe storage, including any incompatibilities

Storage

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

7.3 Specific end uses

Refer to product label.

Section 8. Exposure Controls / Personal Protection

8.1 Control parameters

Exposure Limits

Component	List	Type	Value
Potassium hydroxide; caustic potash	Ireland OELV	STEL	2 mg/m ³
	ACGIH	Ceiling	2 mg/m ³
	UK WEL	STEL	2 mg/m ³

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

8.2 Exposure controls

Personal Protection

Eye/Face Protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin 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.

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. 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.

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. Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: 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.

Section 9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance

Physical State	Liquid.
Color	Brown
Odor	mild, sweet
Odor Threshold	No test data available
pH	7.23 (aqueous 10% slurry)
Melting Point	Not applicable
Freezing Point	No test data available
Boiling Point (760 mmHg)	100 °C.
Flash Point - Closed Cup	88 °C <i>Setaflash Closed Cup ASTM D3828</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Vapor Pressure	22 mmHg @ 20 °C Approx.
Vapor Density (air = 1)	1.14
Specific Gravity (H ₂ O = 1)	1.16 20 °C/20 °C <i>NAPM 2A.00</i>
Solubility in water (by weight)	water solution
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available

Dynamic Viscosity	< 5 mPa.s @ 25.4 °C
Kinematic Viscosity	3.88 cSt @ 20 °C
Explosive properties	No <i>EEC A14</i>
Oxidizing properties	No significant increase (>5C) in temperature.

9.2 Other information

Liquid Density	1.163 g/cm ³ @ 20 °C <i>Digital density meter</i>
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Section 10. Stability and Reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Thermally stable at typical use temperatures.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

10.5 Incompatible Materials: Avoid contact with: Oxidizers. Strong acids.

10.6 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 monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides. Toxic gases are released during decomposition.

Section 11. Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity

Ingestion

Very low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product: LD50, rat, male and female > 5,000 mg/kg

Aspiration hazard

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

Dermal

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

As product: LD50, rabbit > 5,000 mg/kg

Inhalation

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

As product: LC50, 4 h, Aerosol, rat, male and female > 8.11 mg/l

Eye damage/eye irritation

May cause moderate eye irritation. Corneal injury is unlikely.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Sensitization

Skin

Has caused allergic skin reactions when tested in guinea pigs. Did not cause allergic skin reactions when tested in humans.

Respiratory

No relevant data found.

Repeated Dose Toxicity

For the active ingredient(s): Repeated exposure did not produce systemic toxicity when applied to the skin of rabbits.

Chronic Toxicity and Carcinogenicity

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

Developmental Toxicity

For the active ingredient(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity

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

Genetic Toxicology

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Section 12. Ecological Information

12.1 Toxicity

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Acute & Prolonged Toxicity

LC50, *Oncorhynchus mykiss* (rainbow trout), flow-through test, 96 h: 26 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, eastern oyster (*Crassostrea virginica*), flow-through test, 48 h, shell growth inhibition: 18 - 32 mg/l

Aquatic Plant Toxicity

EC50, *Skeletonema costatum*, static test, 120 h: 14 mg/l

EC50, diatom *Navicula* sp., biomass growth inhibition: 3.9 mg/l

Toxicity to Above Ground Organisms

dietary LC50, *Anas platyrhynchos* (Mallard duck): > 10000 mg/kg diet.

dietary LC50, *Colinus virginianus* (Bobwhite quail): > 10000 mg/kg diet.

contact LD50, *Apis mellifera* (bees): > 20 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, *Eisenia fetida* (earthworms), 14 d: > 2,388.89 mg/kg

12.2 Persistence and Degradability

Data for Component: **Picloram Potassium Salt**

For similar active ingredient(s). Picloram. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Biodegradation may occur under aerobic conditions (in the presence of oxygen). Surface photodegradation is expected with exposure to sunlight.

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Data for Component: **Alkylphenol alkoxyate**

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Data for Component: **Potassium hydroxide; caustic potash**

|| Biodegradation is not applicable.

12.3 Bioaccumulative potential

Data for Component: **Picloram Potassium Salt**

Bioaccumulation: For similar active ingredient(s). Picloram. Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Data for Component: **Alkylphenol alkoxyate**

Bioaccumulation: No bioconcentration is expected because of the relatively high water solubility. May foam in water.

Data for Component: **Potassium hydroxide; caustic potash**

|| **Bioaccumulation:** Partitioning from water to n-octanol is not applicable.

12.4 Mobility in soil

Data for Component: **Picloram Potassium Salt**

Mobility in soil: For similar active ingredient(s)., Picloram., Potential for mobility in soil is very high (Koc between 0 and 50).

Data for Component: **Alkylphenol alkoxybate**

Mobility in soil: No data available.

Data for Component: **Potassium hydroxide; caustic potash**

Mobility in soil: No data available for assessment due to technical difficulties with testing.

12.5 Results of PBT and vPvB assessment

Data for Component: **Picloram Potassium Salt**

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

Data for Component: **Alkylphenol alkoxybate**

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Data for Component: **Potassium hydroxide; caustic potash**

Mobility in soil: This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects

Data for Component: **Picloram Potassium Salt**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Data for Component: **Alkylphenol alkoxybate**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Data for Component: **Potassium hydroxide; caustic potash**

Mobility in soil: This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Section 13. Disposal Considerations

13.1 Waste treatment methods

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

Section 14. Transport Information

ADR/RID

14.1 UN number

Not applicable

14.2 UN proper shipping name

Proper Shipping Name: NOT REGULATED

14.3 Transport hazard class(es)

Not applicable

14.4 Packing Group

Not applicable

14.5 Environmental hazards

Not considered environmentally hazardous based on available data

14.6 Special precautions for user

Special Provisions: no data available

Hazard identification No:no data available

ADNR / ADN

14.1 UN number

Not applicable

14.2 UN proper shipping name

Proper Shipping Name: NOT REGULATED

14.3 Transport hazard class(es)

Not applicable

14.4 Packing Group

Not applicable

14.5 Environmental hazards

Not considered environmentally hazardous based on available data

14.6 Special precautions for user

no data available

IMDG

14.1 UN number

Not applicable

14.2 UN proper shipping name

Proper Shipping Name: NOT REGULATED

14.3 Transport hazard class(es)

Not applicable

14.4 Packing Group

Not applicable

14.5 Environmental hazards

Not considered environmentally hazardous based on available data

14.6 Special precautions for user

EMS Number: Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

ICAO/IATA

14.1 UN number

Not applicable

14.2 UN proper shipping name

Proper Shipping Name: NOT REGULATED

14.3 Transport hazard class(es)

Not applicable

14.4 Packing Group

Not applicable

14.5 Environmental hazards

Not applicable

14.6 Special precautions for user

no data available

Section 15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

European Inventory of Existing Commercial Chemical Substances (EINECS)

The components of this product are on the EINECS inventory or are exempt from inventory requirements.

Product Registration Number: MAPP 13869

Registration Information

MAFF 05083

15.2 Chemical Safety Assessment

For proper and safe use of this product, please refer to the approval conditions laid down on the product label.

Section 16. Other Information**Hazard statement in the composition section**

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Risk-phrases in the Composition section

R22	Harmful if swallowed.
R35	Causes severe burns.
R36	Irritating to eyes.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Revision

Identification Number: 50079 / 3027 / Issue Date 2012/11/30 / Version: 4.0

DAS Code: XRM-4713

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

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saflufenacil

Target Plants: Control of natural/wilding pines during site preparation. Used to control annual broadleaf weed. It is a very effective contact and residual control of broad leaf weeds and is used in many crops in pre- and post-emergence.

Resistant Plants: A variety of species, designed to be a tank mix component.

Brands: Detail

Signal Word: **CAUTION**

Use Statement: GENERAL USE

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1. Identification

Product identifier used on the label

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Recommended use of the chemical and restriction on use

Recommended use*: herbicide

* The "Recommended use" identified for this product is provided solely to comply with a US Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Substance number: 574155
EPA Register number: 7969-297
Synonyms: Saflufenacil

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Repr.	2 (unborn child)	Reproductive toxicity
Aquatic Acute	1	Hazardous to the aquatic environment - acute
Aquatic Chronic	1	Hazardous to the aquatic environment - chronic

Label elements

Pictogram:

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Signal Word:
Warning

Hazard Statement:

H361 Suspected of damaging the unborn child.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.

Precautionary Statements (Response):

P391 Collect spillage.
P308 + P311 IF exposed or concerned: Call a POISON CENTER or doctor/physician.

Precautionary Statements (Storage):

P405 Store locked up.

Precautionary Statements (Disposal):

P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

Labeling of special preparations (GHS):

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 32 % dermal

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 30 % oral

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 41 % Inhalation - vapour

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 41 % Inhalation - mist

Product contains the following components and may cause an allergic skin reaction: Preparation based on isothiazolone

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:

HARMFUL IF SWALLOWED.

HARMFUL IF ABSORBED THROUGH SKIN.

May cause moderate but temporary irritation to the eyes.

KEEP OUT OF REACH OF CHILDREN.

KEEP OUT OF REACH OF DOMESTIC ANIMALS.

Avoid contact with the skin, eyes and clothing.

Avoid inhalation of mists/vapours.

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Wash thoroughly after handling.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
372137-35-4	29.74 %	Saflufenacil

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
372137-35-4	29.74 %	Saflufenacil
57-55-6	>= 5.0 - <= 10.0 %	Propylene glycol
	>= 60.0 - <= 70.0 %	Proprietary ingredients

4. First-Aid Measures

Description of first aid measures

General advice:

First aid providers should wear personal protective equipment to prevent exposure. Remove contaminated clothing. Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or physician for treatment advice. Have the product container or label with you when calling a poison control center or doctor or going for treatment.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

If on skin:

Wash thoroughly with soap and water.

If in eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

If swallowed:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

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5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
foam, dry powder, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
carbon monoxide, carbon dioxide, Hydrocarbons, sulfur oxides, nitrogen oxides, halogenated compounds
If product is heated above decomposition temperature, toxic vapours will be released. The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters

Protective equipment for fire-fighting:
Wear self-contained breathing apparatus and chemical-protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

7. Handling and Storage

Precautions for safe handling

RECOMMENDATIONS ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. PESTICIDE APPLICATORS & WORKERS must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170. Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary). Keep away from sources of ignition - No smoking. Keep container tightly sealed. Protect contents from the effects of light. Protect against heat. Protect from air. Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible. Avoid aerosol formation. Avoid dust formation. Provide means for controlling leaks and spills. Do not return residues to the storage containers. Follow label warnings even after container is emptied. The substance/ product may be handled only by appropriately trained personnel. Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapours. Wear suitable personal protective clothing and equipment.

Protection against fire and explosion:

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No special precautions necessary. The substance/product is non-combustible. Product is not explosive.

Conditions for safe storage, including any incompatibilities

Segregate from foods and animal feeds.

Further information on storage conditions: Keep away from heat. Protect from direct sunlight. Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

Protect from temperatures below: -5 °C

Changes in the properties of the product may occur if substance/product is stored below indicated temperature for extended periods of time.

Protect from temperatures above: 40 °C

Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

8. Exposure Controls/Personal Protection

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Advice on system design:

Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal protective equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves, Protective glove selection must be based on the user's assessment of the workplace hazards.

Eye protection:

Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment. Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice. Personal protective equipment should be decontaminated prior to reuse. Gloves must be inspected regularly and prior to each use. Replace if

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necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift. No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	faint odour, fruity	
Odour threshold:		Not determined due to potential health hazard by inhalation.
Colour:	white	
pH value:	approx. 4 - 6	(approx. 20 °C) (as aqueous suspension)
boiling temperature:	100 °C	
Sublimation point:		No applicable information available.
Flash point:		No flash point - Measurement made up to the boiling point.
Flammability:	not applicable	
Lower explosion limit:		As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:		As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Autoignition:	443 °C	(Directive 92/69/EEC, A.15)
Vapour pressure:	approx. 23 hPa	(20 °C) Information applies to the solvent.
Density:	9.6 Lb/USg	(68 °F)
Relative density:		No applicable information available.
Vapour density:		not applicable
Partitioning coefficient n-octanol/water (log Pow):		No applicable information available.
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated.	
Viscosity, dynamic:	33 mPa.s	(20 °C)
Viscosity, kinematic:		No applicable information available.
Solubility in water:		dispersible
Solubility (quantitative):		No applicable information available.
Solubility (qualitative):	No applicable information available.	
Evaporation rate:		not applicable
Other Information:	The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.	

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

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Oxidizing properties:
not fire-propagating (Directive 2004/73/EC, A.21)

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid prolonged storage. Avoid electro-static discharge. Avoid contamination. Avoid prolonged exposure to extreme heat. Avoid extreme temperatures.

Incompatible materials

strong bases, strong acids, strong oxidizing agents

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated.

Thermal decomposition:

No decomposition if stored and handled as prescribed/indicated.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Slightly toxic after single ingestion. Relatively nontoxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

Oral

Type of value: LD50

Species: rat

Value: > 2,000 mg/kg

No mortality was observed.

Inhalation

Type of value: LC50

Species: rat

Value: > 5.5 mg/l

Exposure time: 4 h

An aerosol was tested.

No mortality was observed.

Dermal

Type of value: LD50

Species: rat

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Value: > 5,000 mg/kg
No mortality was observed.

Assessment other acute effects
No applicable information available.

Sensitization
Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

modified Buehler test
Species: guinea pig
Result: Skin sensitizing effects were not observed in animal studies.

Chronic Toxicity/Effects

Repeated dose toxicity
Assessment of repeated dose toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. No substance-specific organotoxicity was observed after repeated administration to animals.

Genetic toxicity
Assessment of mutagenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Mutagenicity tests revealed no genotoxic potential.

Carcinogenicity
Assessment of carcinogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of various animal studies gave no indication of a carcinogenic effect.

Reproductive toxicity
Assessment of reproduction toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity
Assessment of teratogenicity: The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: saflufenacil
Assessment of teratogenicity: Indications of possible developmental toxicity/teratogenicity were seen in animal studies.

Other Information
Misuse can be harmful to health.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

12. Ecological Information

Toxicity

Aquatic toxicity

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Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to fish. There is a high probability that the product is not acutely harmful to aquatic invertebrates. Very toxic (acute effect) to aquatic plants.

Toxicity to fish

Information on: saflufenacil

LC50 (96 h) > 96.8 mg/l, Pimephales promelas (OECD Guideline 203, static)

No observed effect concentration (33 d) >= 9.7 mg/l, Pimephales promelas (OECD Guideline 203, static)

Aquatic invertebrates

Information on: saflufenacil

EC50 (96 h) 8.0 mg/l, Daphnia magna (static)

Aquatic plants

Information on: saflufenacil

EC50 (96 h) 0.113 mg/l (growth rate), Pseudokirchneriella subcapitata (OECD Guideline 201, static)

Assessment of terrestrial toxicity

With high probability not acutely harmful to terrestrial organisms.

Persistence and degradability

Assessment biodegradation and elimination (H2O)

Information on: saflufenacil

Not readily biodegradable (by OECD criteria).

Bioaccumulative potential

Assessment bioaccumulation potential

Information on: saflufenacil

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: saflufenacil

Following exposure to soil, the product trickles away and can - dependant on degradation - be transported to deeper soil areas with larger water loads.

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13. Disposal considerations

Waste disposal of substance:

Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal:

Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA:

This product is not regulated by RCRA.

14. Transport Information

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Hazard class: 9
Packing group: III
ID number: UN 3082
Hazard label: 9, EHSM
Marine pollutant: YES
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains SAFLUFENACIL)

Air transport

IATA/ICAO

Hazard class: 9
Packing group: III
ID number: UN 3082
Hazard label: 9, EHSM
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains SAFLUFENACIL)

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US blocked / not listed

Crop Protection TSCA, US released / exempt

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EPCRA 311/312 (Hazard categories): Chronic;

State regulations

<u>State RTK</u>	<u>CAS Number</u>	<u>Chemical name</u>
PA	57-55-6	Propylene glycol

CA Prop. 65:

Risk assessment indicates No Significant Risk Levels for Carcinogens and No Maximum Allowable Dose Levels for Chemicals Causing Reproductive Toxicity are expected when using this product as labeled for agricultural or residential use.

Labeling requirements under FIFRA

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 workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

CAUTION:

KEEP OUT OF REACH OF CHILDREN.

KEEP OUT OF REACH OF DOMESTIC ANIMALS.

HARMFUL IF SWALLOWED.

HARMFUL IF ABSORBED THROUGH SKIN.

May cause moderate but temporary irritation to the eyes.

Avoid contact with the skin, eyes and clothing.

Avoid inhalation of mists/vapours.

Wash thoroughly after handling.

16. Other Information

SDS Prepared by:

BASF NA Product Regulations

SDS Prepared on: 2014/10/01

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE, IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING

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END OF DATA SHEET

sethoxydim

Target Plants: Control of natural/wilding pines during site preparation. Controls annual and perennial grasses. Known for its crabgrass, bahiagrass, wild oats, and annual ryegrass control.

Resistant Plants: A variety of species, designed to be a tank mix component. Sethoxydim will not kill sedges or broadleaf weeds.

Brands: Poast, Torpedo, Ultima, Vantage, Conclude, Rezult

Signal Word: **CAUTION**

Use Statement: GENERAL USE

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1. Identification

Product identifier used on the label

POAST® HERBICIDE

Recommended use of the chemical and restriction on use

Recommended use*: herbicide

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Substance number: 197605
EPA Registration number: 7969-58
Molecular formula: C₁₇ H₂₉ O₃ N S
Chemical family: heterocyclic, ketone, derivative
Synonyms: sethoxydim

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Asp. Tox.	1	Aspiration hazard
Flam. Liq.	4	Flammable liquids
Acute Tox.	4 (Inhalation - mist)	Acute toxicity
Skin Corr./Irrit.	2	Skin corrosion/irritation
Carc.	2	Carcinogenicity

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STOT SE	3 (Vapours may cause drowsiness and dizziness.)	Specific target organ toxicity — single exposure
Aquatic Acute	1	Hazardous to the aquatic environment - acute
Aquatic Chronic	1	Hazardous to the aquatic environment - chronic

Label elements

Pictogram:



Signal Word:
Danger

Hazard Statement:

H227	Combustible liquid.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H304	May be fatal if swallowed and enters airways.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P201	Obtain special instructions before use.
P273	Avoid release to the environment.
P271	Use only outdoors or in a well-ventilated area.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/gas/mist/vapours.

Precautionary Statements (Response):

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P391	Collect spillage.
P331	Do NOT induce vomiting.
P370 + P378	In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.

Precautionary Statements (Storage):

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

Precautionary Statements (Disposal):

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P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

Labeling of special preparations (GHS):

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 64 % dermal

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 64 % Inhalation - vapour

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 64 % Inhalation - mist

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Weight %</u>	<u>Chemical name</u>
74051-80-2	18.0 %	Sethoxydim
127087-87-0	3.0 - 10.0%	Nonylphenol ethoxylated
64742-94-5	50.0 - 75.0%	Solvent naphtha

4. First-Aid Measures

Description of first aid measures

General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

If on skin:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

If in eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

If swallowed:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention. Do not induce vomiting due to aspiration hazard.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Hazards: Because of the increased risk of chemical pneumonia or pulmonary edema caused by aspiration of the hydrocarbon solvent, vomiting should be induced only under professional supervision.

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Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
foam, dry powder, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
carbon monoxide, carbon dioxide, Sulphur dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons,
If product is heated above decomposition temperature, toxic vapours will be released. The substances/groups of substances mentioned can be released if the product is involved in a fire.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Evacuate area of all unnecessary personnel. Contain contaminated water/firefighting water. Do not allow to enter drains or waterways.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

Methods and material for containment and cleaning up

Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

7. Handling and Storage

Precautions for safe handling

RECOMMENDATIONS ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. PESTICIDE APPLICATORS & WORKERS must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in

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accordance with the EPA Worker Protection Standard 40 CFR part 170. Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary). Keep away from sources of ignition - No smoking. Keep container tightly sealed. Protect contents from the effects of light. Protect against heat. Protect from air. Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible. Avoid aerosol formation. Avoid dust formation. Provide means for controlling leaks and spills. Do not return residues to the storage containers. Follow label warnings even after container is emptied. The substance/ product may be handled only by appropriately trained personnel. Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapours. Wear suitable personal protective clothing and equipment.

Protection against fire and explosion:

The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

Conditions for safe storage, including any incompatibilities

Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

Further information on storage conditions: Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed. Protect from temperatures above: 40 °C
Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

8. Exposure Controls/Personal Protection

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Advice on system design:

Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal protective equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and vapours. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves, Protective glove selection must be based on the user's assessment of the workplace hazards.

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Eye protection:

Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment. Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice. Personal protective equipment should be decontaminated prior to reuse. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift. No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

9. Physical and Chemical Properties

Form:	liquid
Odour:	aromatic
Odour threshold:	Not determined since harmful by inhalation.
Colour:	yellow
pH value:	approx. 3 - 5 (1 %(m), 25 °C)
Freezing point:	approx. -20 °C
Boiling point:	Information applies to the solvent. approx. 178 - 209 °C
Flash point:	Information applies to the solvent. 145 °F
Flammability:	not highly flammable
Lower explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Autoignition:	449 - 510 °C
Vapour pressure:	Information applies to the solvent. approx. 1 hPa (20 °C)
Density:	Information applies to the solvent. approx. 0.93 g/cm ³ (20 °C) 7.7696 Lb/USg (68 °F)
Vapour density:	not applicable
Partitioning coefficient n-octanol/water (log Pow):	not applicable

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Thermal decomposition:	carbon monoxide, carbon dioxide, Sulphur dioxide, nitrogen dioxide, nitrogen oxide, Hydrocarbons Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released.
Viscosity, dynamic:	approx. 2.80 mPa.s (20 °C)
Solubility in water:	emulsifiable
Molar mass:	327.5 g/mol
Evaporation rate:	not applicable
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:

Corrosive effects to metal are not anticipated.

Oxidizing properties:

Not an oxidizer.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.

Hazardous polymerization will not occur. No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to avoid

Incompatible materials

oxidizing agents

Hazardous decomposition products

Decomposition products:

Prolonged thermal loading can result in products of degradation being given off.

Thermal decomposition:

Possible thermal decomposition products:

carbon monoxide, carbon dioxide, Sulphur dioxide, nitrogen dioxide, nitrogen oxide, Hydrocarbons
Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

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Acute toxicity

Assessment of acute toxicity: Slightly toxic after single ingestion. Relatively nontoxic after short-term inhalation. Slightly toxic after short-term skin contact.

Oral

Type of value: LD50

Species: rat (male)

Value: 5,000 mg/kg

Type of value: LD50

Species: rat (female)

Value: 4,285.8 mg/kg

Inhalation

Type of value: LC50

Species: rat

Value: > 7.6 mg/l

Exposure time: 4 h

Dermal

Type of value: LD50

Species: rat

Value: > 5,000 mg/kg

Type of value: LD50

Species: rat

Value: > 4,000 mg/kg

Assessment other acute effects

Assessment of STOT single:

Possible narcotic effects (drowsiness or dizziness).

Irritation / corrosion

Assessment of irritating effects: May cause moderate irritation to the skin. Causes substantial but temporary eye injury.

Skin

Species: rabbit

Result: Irritating.

Eye

Species: rabbit

Result: Irritating.

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Species: guinea pig

Result: Skin sensitizing effects were not observed in animal studies.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: The product has not been tested. The statement has been derived from the properties of the individual components.

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Genetic toxicity

Assessment of mutagenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Mutagenicity tests revealed no genotoxic potential.

Carcinogenicity

Assessment of carcinogenicity: The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: solvent naphtha

Assessment of carcinogenicity: Long-term exposure to highly irritating concentrations resulted in skin tumors in animals. A carcinogenic effect in humans can be excluded after brief skin contact. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Reproductive toxicity

Assessment of reproduction toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity

Assessment of teratogenicity: The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: sethoxydim

Assessment of teratogenicity: Causes developmental effects in animals at high, maternally toxic doses.

Other Information

Misuse can be harmful to health.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Medical conditions aggravated by overexposure

Existing dermatitis may be aggravated by exposure.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to fish. Acutely harmful for aquatic invertebrates. Very toxic (acute effect) to aquatic plants.

Toxicity to fish

LC50 (96 h) 43 - 63 mg/l, Oncorhynchus mykiss

LC50 (96 h) 19.375 mg/l, Cyprinodon variegatus

Aquatic invertebrates

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EC50 (48 h) 18.5 mg/l, *Daphnia magna*

EC50 (96 h) 4.429 mg/l, *Mysidopsis bahia*

Toxicity to fish

Information on: sethoxydim
LC50 (96 h) > 145.8 mg/l, Cyprinodon variegatus

Aquatic invertebrates

Information on: sethoxydim
EC50 (48 h) 73.1 mg/l, Daphnia magna

Aquatic plants

Information on: sethoxydim
EC50 (14 h) > 0.281 mg/l, Lemna gibba (static)
No observed effect concentration (14 h) > 0.281 mg/l, Lemna gibba (static)

Assessment of terrestrial toxicity

With high probability not acutely harmful to terrestrial organisms. Acutely toxic to honeybees.

Other terrestrial non-mammals

Information on: sethoxydim
LD50 > 10 ug/bee, Apis mellifera
LC50, Anas platyrhynchos

Persistence and degradability

Elimination information

Not readily biodegradable (by OECD criteria).

Bioaccumulative potential

Assessment bioaccumulation potential

The product has not been tested. The statement has been derived from the properties of the individual components.

Assessment bioaccumulation potential

Information on: sethoxydim

Mobility in soil

Assessment transport between environmental compartments

The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: sethoxydim

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Following exposure to soil, the product trickles away and can - dependant on degradation - be transported to deeper soil areas with larger water loads.

Additional information

Other ecotoxicological advice:

The ecological data given are those of the active ingredient. Do not release untreated into natural waters.

13. Disposal considerations

Waste disposal of substance:

Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal:

Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

RCRA:

This product is not regulated by RCRA.

14. Transport Information

Land transport

USDOT

Classified as combustible liquid in containers greater than 119 gallons.

Sea transport

IMDG

Hazard class:	9
Packing group:	III
ID number:	UN 3082
Hazard label:	9, EHSM
Marine pollutant:	YES
Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains SOLVENT NAPHTHA)

Air transport

IATA/ICAO

Hazard class:	9
Packing group:	III
ID number:	UN 3082
Hazard label:	9, EHSM
Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains SOLVENT NAPHTHA)

Safety Data Sheet

POAST® HERBICIDE

Revision date : 2017/06/30
Version: 4.0

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(30278610/SDS_CPA_US/EN)

Further information

DOT: Combustible liquid, only regulated in receptacles exceeding 119 gallons; not shipped as dangerous goods in receptacles less than 120 gallons.

15. Regulatory Information

Federal Regulations

Registration status:

Crop Protection TSCA, US released / exempt

Chemical TSCA, US blocked / not listed

EPCRA 311/312 (Hazard categories): Acute; Chronic; Fire

EPCRA 313:

<u>CAS Number</u>	<u>Chemical name</u>
74051-80-2	Sethoxydim
64742-94-5	Solvent naphtha
64742-94-5	Solvent naphtha

<u>CERCLA RQ</u>	<u>CAS Number</u>	<u>Chemical name</u>
100 LBS	64742-94-5	Solvent naphtha

State regulations

<u>State RTK</u>	<u>CAS Number</u>	<u>Chemical name</u>
NJ	64742-94-5	solvent naphtha
	74051-80-2	Sethoxydim
PA	64742-94-5	solvent naphtha

NFPA Hazard codes:

Health : 1 Fire: 2 Reactivity: 1 Special:

Labeling requirements under FIFRA

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 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.
KEEP OUT OF REACH OF CHILDREN.
KEEP OUT OF REACH OF DOMESTIC ANIMALS.
Avoid contact with the skin, eyes and clothing.

16. Other Information

SDS Prepared by:

BASF NA Product Regulations

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SDS Prepared on: 2017/06/30

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

POAST® HERBICIDE is a registered trademark of BASF Corporation or BASF SE
IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE , IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY OUR COMPANY HEREUNDER ARE GIVEN GRATIS AND WE ASSUME NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.
END OF DATA SHEET

sulfometuron methyl

Target Plants: Annual and perennial grasses and broadleaf weeds.

Resistant Plants: Many conifers and hardwood species are resistant.
Bermudagrass, croton, Johnsongrass, trumpetcreeper,
broomsedge.

Brands: Oust XP, Spyder, SFM 75

Signal Word: **CAUTION**

Use Statement: GENERAL USE

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name OUST® XP HERBICIDE

Product code (UVP) 84119822, 85782614

SDS Number 102000030326

EPA Registration No. 432-1552

Relevant identified uses of the substance or mixture and uses advised against

Use Herbicide

Restrictions on use See product label for restrictions.

Information on supplier

Supplier Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
USA

Responsible Department Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days) 1-800-334-7577

Product Information Telephone Number 1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Hazards Not Otherwise Classified (HNOC)

No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
SULFOMETURON METHYL	74222-97-2	75.0
Lignosulfonic acid, sodium salt, sulfomethylated	68512-34-5	4.0
Trisodium orthophosphate	7601-54-9	4.3

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SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Rinse out mouth and give water in small sips to drink. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms	Ingestion may provoke the following symptoms: Tiredness, Increased pulse rate, Dizziness, Shortness of breath, Jaundice
-----------------	---

Indication of any immediate medical attention and special treatment needed

Treatment	Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.
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SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable	Water spray, Dry chemical, Foam, Carbon dioxide (CO ₂)
Unsuitable	High volume water jet

Special hazards arising from the substance or mixture	Dangerous gases are evolved in the event of a fire., Accumulation of fine dust may entail the risk of a dust explosion in the presence of air.
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Advice for firefighters

Special protective equipment for firefighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
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Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Whenever possible, contain fire-fighting water by diking area with sand or earth.
Flash point	Not applicable
Auto-ignition temperature	No data available
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	No data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Ensure adequate ventilation. Handle and open container in a manner as to prevent spillage.

Advice on protection against fire and explosion Keep away from heat and sources of ignition. Dust may form explosive mixture in air.

Hygiene measures Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

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Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container and out of the reach of children, preferably in a locked storage area. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Keep away from direct sunlight.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
SULFOMETURON METHYL	74222-97-2	5 mg/m ³ (TWA)	02 2012	ACGIH
SULFOMETURON METHYL	74222-97-2	3.5 mg/m ³ (TWA PEL)	08 2010	US CA OEL
Trisodium orthophosphate	7601-54-9	5 mg/m ³ (STEL)	2012	WEEL

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection Chemical resistant nitrile rubber gloves

Eye protection Safety glasses with side-shields

Skin and body protection Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.
Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance white to beige
Physical State small rod
Odor slight
Odour Threshold No data available
pH 7.8 at 1 %
(as aqueous solution)

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Vapor Pressure	No data available
Vapor Density (Air = 1)	No data available
Density	ca. 0.64 g/ml
Bulk density	39 lb/ft ³ (bulk density tapped)
Evaporation rate	Not applicable
Boiling Point	Not applicable
Melting / Freezing Point	Not applicable
Water solubility	dispersible
Minimum Ignition Energy	Not applicable
Decomposition temperature	No data available
Partition coefficient: n-octanol/water	Not applicable
Viscosity	Not applicable
Flash point	Not applicable
Auto-ignition temperature	No data available
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	No data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition	No data available
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	No data available
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Eye contact, Skin contact, Ingestion, Inhalation
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Immediate Effects

Eye May cause redness, irritation, tearing.
Skin May cause slight irritation.

Information on toxicological effects

Acute oral toxicity LD50 (Rat) > 5,000 mg/kg
Acute inhalation toxicity LC50 (Rat) > 5.3 mg/l
Exposure time: 4 h
Acute dermal toxicity LD50 (Rabbit) > 5,000 mg/kg
Skin irritation slight irritation (Rabbit)
Eye irritation slight irritation (Rabbit)
Sensitisation Non-sensitizing. (Guinea pig)

ACGIH

SULFOMETURON METHYL 74222-97-2 Group A4

NTP

None.

IARC

None.

OSHA

None.

Further information

Only acute toxicity studies have been performed on the formulated product.

SECTION 12: ECOLOGICAL INFORMATION

Chronic toxicity to fish Oncorhynchus mykiss (rainbow trout)
LC50: > 148 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient sulfometuron methyl.
Lepomis macrochirus (Bluegill sunfish)
LC50: > 150 mg/l
Exposure time: 96 d
The value mentioned relates to the active ingredient sulfometuron methyl.

Chronic toxicity to aquatic invertebrates EC50 (Daphnia (water flea)): 150 mg/l
Exposure time: 48 h
The value mentioned relates to the active ingredient sulfometuron methyl.

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Toxicity to aquatic plants	EC50 (Raphidocelis subcapitata (freshwater green alga)) 0.0046 mg/l Exposure time: 120 h The value mentioned relates to the active ingredient sulfometuron methyl.
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Drift or runoff from treated areas may adversely affect non-target plants. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	Do not contaminate water, food, or feed by disposal. Dispose of unused product by incineration at a licensed incineration plant, in accordance with all applicable national and local regulations.
Contaminated packaging	Consult state and local regulations regarding the proper disposal of container. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR	Not dangerous goods / not hazardous material
IMDG	
UN number	3077
Class	9
Packaging group	III
Marine pollutant	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (SULFOMETURON METHYL MIXTURE)
IATA	
UN number	3077
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

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(SULFOMETURON METHYL MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1552

US Federal Regulations

TSCA list

Lignosulfonic acid, sodium salt, 68512-34-5
sulfomethylated

Trisodium orthophosphate 7601-54-9

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

Not applicable.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

Trisodium orthophosphate 7601-54-9 CA, CT, IL, MN, NJ

EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Moderate eye irritation.
Avoid contact with skin, eyes and clothing.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR Code of Federal Regulations, Title 49

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ACGIH	US. ACGIH Threshold Limit Values
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

NFPA 704 (National Fire Protection Association):

Health - 1 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: The following sections have been revised: Section 2: Hazards Identification. Section 3: Composition / Information on Ingredients. Section 8: Exposure Controls / Personal Protection. Reviewed and updated for general editorial purposes.

Revision Date: 02/20/2018

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

triclopyr

Target Plants: Controls broad spectrum of woody plants, broadleaf weeds and vines.

Resistant Plants: Black cherry, persimmon, sumac, hickory. Little or no impact on most grasses.

Brands: Amine: Garlon 3A, Element 3A, Tahoe 3A, Triclopyr 3

Choline: Vastlan

Ester: Garlon XRT, Garlon 4 Ultra, Boulder 63, Element 4, Pathfinder II, Triclopyr 4

RTU: Relegate RTU, Triclopyr RTU

Signal Word: Amine formulations = **DANGER**
Choline formulations = **WARNING**
Ester and RTU formulations = **CAUTION**

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: GARLON™ 3A Herbicide

Issue Date: 04/04/2016

Print Date: 04/04/2016

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: GARLON™ 3A Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Flammable liquids - Category 3

Eye irritation - Category 2A

Specific target organ toxicity - repeated exposure - Category 2

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Flammable liquid and vapour.

Causes serious eye irritation.

May cause damage to organs (Kidney) through prolonged or repeated exposure.

Precautionary statements**Prevention**

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ ventilating/ lighting/ equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

Wash skin thoroughly after handling.

Wear protective gloves/ eye protection/ face protection.

Response

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Get medical advice/ attention if you feel unwell.

If eye irritation persists: Get medical advice/ attention.

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage

Store in a well-ventilated place. Keep cool.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Mixture

This product is a mixture.

Component	CASRN	Concentration
Triclopyr Triethylamine Salt	57213-69-1	44.4%
Ethanol	64-17-5	2.1%
Alkylphenol alkoxyate	69029-39-6	1.0%
Balance	Not available	52.5%

4. FIRST AID MEASURES

Description of first aid measures

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

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

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

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

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. May produce flash fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

Advice for firefighters

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

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. Refer to section 7, Handling, for additional precautionary measures. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

Methods and materials for containment and cleaning up: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Keep out of reach of children. No smoking, open flames or sources of ignition in handling and storage area. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Do not get in eyes. Avoid contact with skin and clothing. Avoid breathing vapor or mist. Do not swallow. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Electrically ground and bond all equipment. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Use of non-sparking or explosion-proof equipment may be necessary,

depending upon the type of operation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies. Minimize sources of ignition, such as static build-up, heat, spark or flame.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Triclopyr Triethylamine Salt	Dow IHG	TWA	2 mg/m ³
	Dow IHG	TWA	SKIN, DSEN, BEI
Ethanol	ACGIH	TWA	1,000 ppm
	ACGIH	STEL	1,000 ppm
	OSHA Z-1	TWA	1,900 mg/m ³ 1,000 ppm
	CAL PEL	PEL	1,900 mg/m ³ 1,000 ppm
Alkylphenol alkoxyolate	Dow IHG	TWA	2 mg/m ³

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

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

Other protection: Wear clean, body-covering clothing.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Pink
Odor	Ammoniacal
Odor Threshold	No test data available
pH	9.5 10% <i>pH Electrode</i>
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup 43 °C (109 °F) <i>Setaflash Closed Cup ASTM D3828</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No data available
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	1.1385 at 20 °C (68 °F) <i>Digital Density Meter (Oscillating Coil)</i>
Water solubility	Soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	12.5 mPa.s at 25 °C (77 °F)
Kinematic Viscosity	No test data available
Explosive properties	No <i>Thermal</i>
Oxidizing properties	No
Liquid Density	1.1385 g/cm ³ at 20 °C (68 °F) <i>Digital density meter</i>
Molecular weight	No data available
Surface tension	38.5 mN/m at 20 °C (68 °F) <i>EC Method A5</i>

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures.

Incompatible materials: Avoid contact with: Oxidizers.

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

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, Rat, female, 4,100 mg/kg

Acute dermal toxicity

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

As product:

LD50, Rabbit, male and female, > 5,000 mg/kg

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to mist. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

As product:

LC50, Rat, male and female, 4 Hour, Mist, > 5.4 mg/l

Maximum attainable concentration.

No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation

May cause moderate eye irritation.

May cause moderate corneal injury.

Sensitization

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

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

Kidney.

For the minor component(s):

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

Kidney.

Liver.

Carcinogenicity

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

Teratogenicity

For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

For the minor component(s): Has caused birth defects in lab animals at high doses.

Reproductive toxicity

For similar active ingredient(s). Triclopyr. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Toxicity**Acute toxicity to fish**

Based on information for a similar material:

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

LC50, *Oncorhynchus mykiss* (rainbow trout), 96 Hour, 400 mg/l, OECD Test Guideline 203 or Equivalent

LC50, *Lepomis macrochirus* (Bluegill sunfish), semi-static test, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates

EC50, eastern oyster (*Crassostrea virginica*), static test, 48 Hour, 56 - 87 mg/l, Method Not Specified.

LC50, Daphnia magna (Water flea), static test, 48 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate inhibition, 107 mg/l, OECD Test Guideline 201 or Equivalent

ErC50, blue-green alga Anabaena flos-aquae, 72 Hour, Growth inhibition, > 100 mg/l

EC50, Lemna gibba, 7 d, Growth inhibition, > 100 mg/l

Based on information for a similar material:

ErC50, Myriophyllum spicatum, 14 d, 0.241 mg/l

Based on information for a similar material:

NOEC, Myriophyllum spicatum, 14 d, 0.0191 mg/l

Persistence and degradability

Triclopyr Triethylamine Salt

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

For similar active ingredient(s). Triclopyr. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Ethanol

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

10-day Window: Pass

Biodegradation: > 70 %

Exposure time: 5 d

Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 2.08 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 2.99 d

Method: Estimated.

Alkylphenol alkoxylate

Biodegradability: Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Theoretical Oxygen Demand: 2.35 mg/mg

Chemical Oxygen Demand: 1.78 mg/mg

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Triclopyr Triethylamine Salt

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

Ethanol

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

Partition coefficient: n-octanol/water(log Pow): -0.31 Measured

Alkylphenol alkoxyate

Bioaccumulation: No bioconcentration is expected because of the relatively high water solubility. May foam in water.

Balance

Bioaccumulation: No relevant data found.

Mobility in soil

Triclopyr Triethylamine Salt

For similar active ingredient(s).
Potential for mobility in soil is very high (Koc between 0 and 50).

Ethanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 1.0 Estimated.

Alkylphenol alkoxyate

No data available.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Combustible liquid, n.o.s.(Triclopyr Triethylamine Salt, Ethanol)
UN number	NA 1993
Class	CBL
Packing group	III

Classification for SEA transport (IMO-IMDG):

Proper shipping name	FLAMMABLE LIQUID, N.O.S.(Triclopyr Triethylamine Salt, Ethanol)
UN number	UN 1993
Class	3
Packing group	III
Marine pollutant	Triclopyr Triethylamine Salt
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Flammable liquid, n.o.s.(Triclopyr Triethylamine Salt, Ethanol)
UN number	UN 1993
Class	3
Packing group	III

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Fire Hazard
Acute Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components
Triclopyr Triethylamine Salt

CASRN
57213-69-1

Pennsylvania Worker and Community Right-To-Know Act:

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Ethanol	64-17-5

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-037

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:

DANGER

Corrosive

Causes irreversible eye damage

Harmful if swallowed or absorbed through skin

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

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
3	2	0

Revision

Identification Number: 101199615 / A211 / Issue Date: 04/04/2016 / Version: 9.0

DAS Code: XRM-3724

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Dow IHG	Dow Industrial Hygiene Guideline

OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
PEL	Permissible exposure limit
SKIN, DSEN, BEI	Absorbed via Skin, Skin Sensitizer, Biological Exposure Indice
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

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.

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

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: GARLON™ XRT Herbicide

Issue Date: 05/14/2015

Print Date: 01/26/2017

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: GARLON™ XRT Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Eye irritation - Category 2A

Skin sensitisation - Sub-category 1B

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

May cause an allergic skin reaction.
Causes serious eye irritation.

Precautionary statements**Prevention**

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.
Wear eye protection/ face protection.
Wear protective gloves.

Response

IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Disposal

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

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Triclopyr-2-butoxyethyl ester	64700-56-7	83.9%
Balance	Not available	16.1%

4. FIRST AID MEASURES

Description of first aid measures

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

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

Skin contact: Take off contaminated clothing. 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.

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 work area.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

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: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Phosgene.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. Spills or discharge to natural waterways is likely to kill aquatic organisms.

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Triclopyr-2-butoxyethyl ester	Dow IHG	TWA	2 mg/m ³
	Dow IHG	TWA	SKIN, DSEN, BEI

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

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

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

Other protection: Use chemical protective clothing resistant to this material, when there is any possibility of skin contact. Wear a face-shield which allows use of chemical goggles, or wear a full-face respirator, to protect face and eyes when there is any likelihood of splashes.

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. In misty atmospheres, use an approved particulate respirator.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow to orange
Odor	Musty
Odor Threshold	no data available
pH	4.49 1% pH Electrode (1% aqueous suspension)
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup > 100 °C (> 212 °F) <i>Closed Cup</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available

Relative Density (water = 1)	no data available
Water solubility	emulsifiable
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	Ramped Temperature
Decomposition temperature	No test data available
Dynamic Viscosity	191.4 mPa.s at 20.4 °C (68.7 °F)
Kinematic Viscosity	No test data available
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	1.2572 g/cm ³ at 20 °C (68 °F) <i>Digital density meter</i>
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides. Toxic gases are released during decomposition. Decomposition products can include trace amounts of: Phosgene.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, Rat, female, 2,966 mg/kg

Acute dermal toxicity

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

As product:
LD50, Rat, male and female, > 5,000 mg/kg

Acute inhalation toxicity

Prolonged excessive exposure to mist may cause adverse effects.

As product:
LC50, Rat, male and female, 4 Hour, dust/mist, > 5.90 mg/l

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.
May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause moderate eye irritation.
May cause slight corneal injury.

Sensitization

Has demonstrated the potential for contact allergy in mice.

For respiratory sensitization:
No relevant information found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):
In animals, effects have been reported on the following organs:
Kidney.
Liver.

Carcinogenicity

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

Teratogenicity

For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity

For similar active ingredient(s). Triclopyr. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

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

Toxicity

Triclopyr-2-butoxyethyl ester

Acute toxicity to fish

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, Lepomis macrochirus (Bluegill sunfish), flow-through test, 96 Hour, 0.36 mg/l

LC50, Fish., 96 Hour, 0.310 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 2.9 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate inhibition, > 3.00 mg/l, OECD Test Guideline 201

EbC50, diatom Navicula sp., 120 Hour, Biomass, 0.193 mg/l

EbC50, Lemna gibba, Biomass, 2.2 mg/l

Chronic toxicity to fish

NOEC, Rainbow trout (Oncorhynchus mykiss), 0.0263 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, number of offspring, 1.6 mg/l

LOEC, Daphnia magna (Water flea), 21 d, number of offspring, 5.1 mg/l

MATC (Maximum Acceptable Toxicant Level), Daphnia magna (Water flea), 21 d, number of offspring, 2.9 mg/l

Toxicity to Above Ground Organisms

Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg).

Material is slightly toxic to birds on a dietary basis (LC50 between 1001 and 5000 ppm).

oral LD50, Colinus virginianus (Bobwhite quail), 21 d, 735 mg/kgmg/kg bodyweight.

dietary LC50, Colinus virginianus (Bobwhite quail), 8 d, 1,890 mg/kgmg/kg bodyweight.

oral LD50, Apis mellifera (bees), 48 Hour, mortality, > 110µg/bee

contact LD50, Apis mellifera (bees), 48 Hour, mortality, > 100µg/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, > 1,042 mg/kg

LC50, Eisenia fetida (earthworms), 14 d, > 521 mg/kg

Balance

Acute toxicity to fish

No relevant data found.

Persistence and degradability

Triclopyr-2-butoxyethyl ester

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

10-day Window: Fail

Biodegradation: 18 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Theoretical Oxygen Demand: 1.39 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
	0.004 mg/mg

Stability in Water (1/2-life)

Hydrolysis, half-life, 8.7 d, pH 7, Half-life Temperature 25 °C

Photodegradation

Atmospheric half-life: 5.6 Hour

Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Bioaccumulation: No data available.

Mobility in soil

Triclopyr-2-butoxyethyl ester

Calculation of meaningful sorption data was not possible due to very rapid degradation in the soil.

For the degradation product:

Triclopyr.

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

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Triclopyr-2-butoxyethyl ester)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	Triclopyr-2-butoxyethyl ester
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(Triclopyr-2-butoxyethyl ester)
UN number	UN 3082
Class	9
Packing group	III

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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 Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components	CASRN
Glycol Ether(s)	None

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number:

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.

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101197915 / A211 / Issue Date: 05/14/2015 / Version: 3.0

DAS Code: GF-1665

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

Legend

Dow IHG	Dow Industrial Hygiene Guideline
SKIN, DSEN, BEI	Absorbed via Skin, Skin Sensitizer, Biological Exposure Indice
TWA	Time Weighted Average (TWA):

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.

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

PreMixed Products

Aminopyralid & Metsulfuron Methyl

Brands: Opensight

Signal Word: **WARNING**

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: OPENSIGHT™ Herbicide

Issue Date: 05/04/2015

Print Date: 05/07/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: OPENSIGHT™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994

info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Eye irritation - Category 2B

Carcinogenicity - Category 2

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Causes eye irritation.
Suspected of causing cancer.

Precautionary statements**Prevention**

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wash skin thoroughly after handling.
Use personal protective equipment as required.

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.

Storage

Store locked up.

Disposal

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

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Aminopyralid Potassium	566191-87-5	62.13%
Metsulfuron-methyl	74223-64-6	9.45%
Titanium dioxide	13463-67-7	0.1%
Kaolin	1332-58-7	>= 0.2 - <= 5.2 %
Balance	Not available	>= 23.12 - <= 28.12 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

Skin contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Suitable emergency safety shower facility should be available in work area.

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 work area.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: May cause injury due to mechanical action. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires. Move container from fire area if this is possible without hazard. Contain fire water run-

off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Do not swallow. Avoid breathing dust or mist. Use with adequate ventilation. Good housekeeping and controlling of dusts are necessary for safe handling of product. Keep away from heat, sparks and flame.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Titanium dioxide	OSHA Z-1	TWA total dust	15 mg/m ³
	ACGIH	TWA	10 mg/m ³ , Titanium dioxide
Kaolin	ACGIH	TWA Respirable fraction	2 mg/m ³
	OSHA Z-1	TWA total dust	15 mg/m ³
	OSHA Z-1	TWA respirable fraction	5 mg/m ³

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

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

Other 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.

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.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Granules.
Color	Brown
Odor	Mild
Odor Threshold	no data available
pH	10.3 1% pH Electrode (1% dispersion)
Melting point/range	No test data available
Freezing point	Not applicable
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup Not applicable
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	no data available
Lower explosion limit	Not applicable

Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	Not applicable
Water solubility	No test data available
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	Not applicable
Decomposition temperature	No test data available
Dynamic Viscosity	Not applicable
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	Not applicable
Bulk density	0.0007 kg/m ³ <i>Literature</i>
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

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

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

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

As product:

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

Acute dermal toxicity

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

As product:

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

Acute inhalation toxicity

Inhalation is unlikely due to physical state. No adverse effects are anticipated from single exposure to dust.

LC50, Rat, male and female, 4 Hour, dust/mist, > 5.09 mg/l

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation.

May cause slight corneal injury.

Solid or dust may cause irritation or corneal injury due to mechanical action.

Sensitization

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

For respiratory sensitization:

No relevant information found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For similar active ingredient(s).

Aminopyralid.

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

Gastrointestinal tract.

Carcinogenicity

Lung fibrosis and tumors have been observed in rats exposed to titanium dioxide in two lifetime inhalation studies. Effects are believed to be due to overloading of the normal respiratory clearance mechanisms caused by the extreme study conditions. Workers exposed to titanium dioxide in the workplace have not shown an unusual incidence of chronic respiratory disease or lung cancer. Titanium dioxide was not carcinogenic in laboratory animals in lifetime feeding studies. For the active ingredient(s): Aminopyralid. Metsulfuron-methyl. Did not cause cancer in laboratory animals.

Teratogenicity

For the active ingredient(s): Aminopyralid. Metsulfuron-methyl. Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive toxicity

For the active ingredient(s): Aminopyralid. Metsulfuron-methyl. In animal studies, did not interfere with reproduction.

Mutagenicity

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

For the active ingredient(s): Metsulfuron-methyl. In vitro genetic toxicity studies were predominantly negative.

Aspiration Hazard

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

Carcinogenicity

Component

Titanium dioxide

List

IARC

Classification

Group 2B: Possibly carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

Acute toxicity to fish

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), semi-static test, 96 Hour, > 120 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), semi-static test, 48 Hour, > 120 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, *Pseudokirchneriella subcapitata* (green algae), static test, 72 Hour, Growth rate inhibition, 17.58 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

oral LD50, *Colinus virginianus* (Bobwhite quail), > 2,250 mg/kg

Toxicity to soil-dwelling organisms

LC50, *Eisenia fetida* (earthworms), 14 d, survival, 2,000 mg/kg

Persistence and degradability

Aminopyralid Potassium

Biodegradability: For similar active ingredient(s). Aminopyralid. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Fail

Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Metsulfuron-methyl

Biodegradability: No appreciable biodegradation is expected.

Titanium dioxide

Biodegradability: Biodegradation is not applicable.

Kaolin

Biodegradability: Biodegradation is not applicable.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Bioaccumulation: No data available.

Mobility in soil

Aminopyralid Potassium

For similar active ingredient(s).
Aminopyralid.
Potential for mobility in soil is very high (Koc between 0 and 50).

Metsulfuron-methyl

No data available.

Titanium dioxide

No data available.

Kaolin

No relevant data found.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):**Transport in bulk
according to Annex I or II
of MARPOL 73/78 and the
IBC or IGC Code**

Not regulated for transport

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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 Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

ComponentsTitanium dioxide
Kaolin**CASRN**13463-67-7
1332-58-7**Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:**

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-597

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

16. OTHER INFORMATION**Hazard Rating System****NFPA**

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101188048 / A211 / Issue Date: 05/04/2015 / Version: 4.0

DAS Code: GF-2050

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
TWA	8-hour, time-weighted average

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.

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

Aminopyralid & Triclopyr

Brands: Capstone, Milestone VM Plus

Signal Word: CAUTION

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: CAPSTONE™ Herbicide

Issue Date: 04/27/2015

Print Date: 05/07/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: CAPSTONE™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994

info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Flammable liquids - Category 4

Eye irritation - Category 2A

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

Combustible liquid.
Causes serious eye irritation.

Precautionary statements**Prevention**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Wash skin thoroughly after handling.
Wear protective gloves/ eye protection/ face protection.

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage

Store in a well-ventilated place. Keep cool.

Disposal

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

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Plant growth regulator
This product is a mixture.

Component	CASRN	Concentration
Triclopyr Triethylamine Salt	57213-69-1	16.22%
Aminopyralid Triisopropanolamine Salt	566191-89-7	2.22%
Ethylenediamine tetraacetic acid	60-00-4	0.8%
Balance	Not available	80.76%

4. FIRST AID MEASURES

Description of first aid measures

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

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

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

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

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. May produce flash fire. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. No smoking in area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

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

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Use with adequate ventilation.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Triclopyr Triethylamine Salt	Dow IHG	TWA	2 mg/m ³
	Dow IHG	TWA	SKIN, DSEN, BEI

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

Exposure controls

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

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: 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.

Other 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.

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Red to brown
Odor	Mild
Odor Threshold	No test data available
pH	7.3
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup > 100 °C (> 212 °F)
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	no data available
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	1.0528 <i>Unspecified</i>

Water solubility	Soluble
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	92/69/EEC A15 none below 400 degC
Decomposition temperature	No test data available
Dynamic Viscosity	< 3 mPa.s
Kinematic Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	No
Liquid Density	1.0528 g/cm ³ <i>Digital density meter</i>
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

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

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with: Oxidizers.

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

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, Rat, female, 3,752 mg/kg

Acute dermal toxicity

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

As product:
LD50, Rat, > 5,000 mg/kg

Acute inhalation toxicity

Prolonged exposure is not expected to cause adverse effects. Based on the available data, respiratory irritation was not observed.

As product:
LC50, Rat, 4 Hour, dust/mist, > 5.34 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact may cause skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation.
May cause slight corneal injury.

Sensitization

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Contains component(s) which are classified as specific target organ toxicant, single exposure, category 3.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For similar active ingredient(s).
Triclopyr.
Aminopyralid.
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Gastrointestinal tract.

Carcinogenicity

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

Teratogenicity

For similar active ingredient(s). Triclopyr. Aminopyralid. Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive toxicity

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

Mutagenicity

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

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity**Acute toxicity to fish**

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), flow-through test, 96 Hour, > 800 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), flow-through test, 48 Hour, > 800 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, diatom *Navicula* sp., 96 Hour, Growth rate inhibition, > 100 mg/l, Method Not Specified.

ErC50, *Myriophyllum spicatum*, 14 d, > 1 mg/l

Toxicity to Above Ground Organisms

Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg).

oral LD50, *Colinus virginianus* (Bobwhite quail), 1839mg/kg bodyweight.

oral LD50, *Apis mellifera* (bees), 48 Hour, 133.0micrograms/bee

contact LD50, *Apis mellifera* (bees), 48 Hour, > 191.6micrograms/bee

Toxicity to soil-dwelling organisms

LC50, *Eisenia fetida* (earthworms), 14 d, > 0.3508 mg/kg

Persistence and degradability**Triclopyr Triethylamine Salt**

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

For similar active ingredient(s). Triclopyr. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Aminopyralid Triisopropanolamine Salt

Biodegradability: For similar material(s): Aminopyralid. Material is not readily biodegradable according to OECD/EEC guidelines.

Ethylenediamine tetraacetic acid

Biodegradability: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).

10-day Window: Not applicable

Biodegradation: 37 %

Exposure time: 14 d

Method: OECD Test Guideline 302B or Equivalent

10-day Window: Fail

Biodegradation: 0 %

Exposure time: 30 d

Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 1.37 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 2.12 Hour

Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Triclopyr Triethylamine Salt

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

Aminopyralid Triisopropanolamine Salt

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

Ethylenediamine tetraacetic acid

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

Partition coefficient: n-octanol/water(log Pow): -3.86 at 25 °C Estimated.

Bioconcentration factor (BCF): 1.1 Fish. 28 d Measured

Balance

Bioaccumulation: No relevant data found.

Mobility in soil

Triclopyr Triethylamine Salt

For similar active ingredient(s).

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

Aminopyralid Triisopropanolamine Salt

For similar active ingredient(s).

Aminopyralid.

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

Ethylenediamine tetraacetic acid

Potential for mobility in soil is high (Koc between 50 and 150).

Partition coefficient(Koc): 98

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Combustible liquid, n.o.s.(Triethylamine)
UN number	NA 1993
Class	CBL
Packing group	III

Classification for SEA transport (IMO-IMDG):

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Not regulated for transport Consult IMO regulations before transporting ocean bulk
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Classification for AIR transport (IATA/ICAO):

Not regulated for transport

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard
Fire Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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.

Pennsylvania Worker and Community Right-To-Know Act:

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Ethylenediamine tetraacetic acid	60-00-4

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-572

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

Harmful if swallowed
Causes moderate eye irritation

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity

1	2	0
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Revision

Identification Number: 101223403 / A211 / Issue Date: 04/27/2015 / Version: 3.0

DAS Code: GF-1883

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

Legend

Dow IHG	Dow Industrial Hygiene Guideline
SKIN, DSEN, BEI	Absorbed via Skin, Skin Sensitizer, Biological Exposure Indice
TWA	Time Weighted Average (TWA):

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.

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

Dicamba & 2,4-D

Brands: Brush-Rhap, Spitfire, Weberan 720, Weedmaster

Signal Word: **DANGER**

Use Statement: GENERAL USE



1. IDENTIFICATION

Product Name: Weedmaster® Herbicide

EPA Reg. No.: 71368-34

Product Type: Herbicide

Company Name: Nufarm Inc.
11901 S. Austin Avenue
Alsip, IL 60803
1-800-345-3330

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS

Not Hazardous

HEALTH HAZARDS

Serious eye damage	Category 1
Acute toxicity, oral	Category 4

ENVIRONMENTAL HAZARDS

Hazardous to aquatic environment, acute	Category 2
Hazardous to aquatic environment, chronic	Category 2

SIGNAL WORD

DANGER

HAZARD STATEMENTS:

Causes serious eye damage. Harmful swallowed. Toxic to aquatic life with long lasting effects.

**PRECAUTIONARY STATEMENTS**

Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves and eye protection. Avoid release to the environment.

IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth.

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 or doctor.

Collect spillage. Dispose of contents in accordance with local, state, and federal regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid	2008-39-1	34.6 – 36.8
Dimethylamine Salt of Dicamba (3,6-Dichloro-o-anisic Acid)	2300-66-5	11.8 – 13
Other Ingredients	Trade Secret	Trade Secret

Synonyms: DMA salts of 2,4-Dichlorophenoxyacetic acid and Dicamba

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get immediate medical attention.

If Swallowed: 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. Do not give anything by mouth to an unconscious person. If symptoms develop, get medical advice.

If on Skin or Clothing: Take off contaminated clothing. Wash skin with soap and water. Get medical attention if irritation develops.

If Inhaled: Move person to fresh air. If symptoms develop, get medical advice.

Most Important symptoms/effects, acute and delayed: Causes severe eye irritation. Corrosive to eyes. May cause slight skin irritation.

Indication of Immediate medical attention and special treatment if needed:

Seek immediate medical attention for eye exposure. Causes severe, irreversible eye damage.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride, nitrogen oxides, and carbon oxides.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Clean-Up and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:

Do not get in eyes, on skin or on clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately, if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove (PPE) immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Storage:

Do not store below 32° F or above 100° F. Store in original container in a well-ventilated area separately from fertilizer, feed, and foodstuffs. Avoid cross-contamination with other pesticides. Do not contaminate water, food, or feed by storage and disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Some materials that are chemical-resistant to this product are barrier laminate, butyl rubber, nitrile rubber or Viton. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.

Eye/Face Protection: To avoid contact with eyes, wear goggles. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, shoes plus socks, chemical-resistant gloves. Mixers and loaders must wear a chemical-resistant apron when applying postharvest dips or sprays to citrus, mixing or loading, cleaning up spills or equipment, or otherwise exposed to the concentrate. Washing facilities should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) Do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored. 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
DMA Salt of 2,4-D	10*	NE	10* (inhalable, skin)	NE	mg/m ³
DMA Salt of Dicamba	NE	NE	NE	NE	
Other Ingredients	NE	NE	NE	NE	

*Based on adopted limit for 2,4-D

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES
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Appearance:	Clear amber liquid
Odor:	Slight ammonia
Odor threshold:	No data available
pH:	8.50 (1% w/w dilution in DIW)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	Not applicable due to aqueous formulation
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.165 g/ml @ 25.2° C; 1.155 g/ml @ 40.5 ° C
Solubility(ies):	No data available
Partition coefficient: n-octanol/water:	No data available
Autoignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	9.507 cPs @ 25.2° C; 5.792 cPs @ 40.5 ° C

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Chemical Stability: This material is stable under normal handling and storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Excessive heat. Do not store near heat or flame.

Incompatible Materials: Strong oxidizing agents: bases and acids.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride, nitrogen oxides, and carbon oxides.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact.

Eye Contact: Corrosive. Causes irreversible eye damage..

Skin Contact: This product is considered a minimal skin irritant and is not a dermal sensitizer.

Ingestion: This product may be harmful if swallowed based on toxicity studies.

Inhalation: This product is practically non-toxic based on toxicity studies.

Delayed, immediate and chronic effects of exposure: None reported.

Toxicological Data:

Data from laboratory studies conducted on this product are summarized below:

Oral: Rat LD₅₀: 1,256 mg/kg

Dermal: Rabbit LD₅₀: >5,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >2.07 mg/L (no mortalities at highest dose tested)

Eye Irritation: Rabbit: Severely irritating

Skin Irritation: Rabbit: Slightly irritating (PDII= 1.4)

Skin Sensitization: Guinea Pig: Not a contact sensitizer

Subchronic (Target Organ) Effects: Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods. Repeated overexposure to dicamba may cause liver changes or a decrease in body weight.

Carcinogenicity / Chronic Health Effects: The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a Class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic potential. Dicamba did not cause cancer in long-term animals studies. The U.S. EPA has given 2,4-D and dicamba a Class D classification (not classifiable as to human carcinogenicity).

Reproductive Toxicity: No impairment of reproductive function attributable to 2,4-D have been noted in laboratory animal studies. Dicamba did not interfere with fertility in reproduction studies in laboratory animals.

Developmental Toxicity: Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals. Animal tests with dicamba have not demonstrated developmental effects.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that 2,4-D is not mutagenic. Animal tests with dicamba have not demonstrated mutagenic effects.

Assessment of Carcinogenicity:

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides (2,4-D)	No	2B	No	No
Dicamba	No	No	No	No
Other Ingredients	No	No	No	No

12. ECOLOGICAL INFORMATION

Ecotoxicity:

This product is toxic to fish and aquatic invertebrates. Classification is based on the parent acid (2,4-D Acid).

Data on 2,4-D, Dimethylamine Salt:

96-hour LC ₅₀ Bluegill:	524 mg/l	Bobwhite Quail Oral LD ₅₀ :	500 mg/kg
96-hour LC ₅₀ Rainbow Trout:	250 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>5,620 ppm
48-hour EC ₅₀ Daphnia:	184 mg/l		

Data on Dicamba Dimethylamine Salt:

96-hour LC ₅₀ Bluegill:	100 mg/l	Bobwhite Quail 8-day Dietary LC ₅₀ :	>4,640 ppm
96-hour LC ₅₀ Rainbow Trout:	100 mg/l	Mallard Duck 8-day Dietary LC ₅₀ :	>4,640 ppm
48-hour EC ₅₀ Daphnia:	160 mg/l		

Environmental Fate:

In laboratory and field studies, 2,4-D DMA salt rapidly dissociated to parent acid in the environment. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks. Dicamba poorly binds to soil particles, is potentially mobile in the soil and highly soluble in water. Aerobic soil metabolism is the main degradative process for dicamba with a typical half-life of 2 weeks. Degradation is slower when low soil moisture limits microbe populations. In water, microbial degradation is the main route of dicamba dissipation. Aquatic hydrolysis, volatilization, adsorption to sediments, and bioconcentration are not expected to be significant.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. If recycling or reconditioning not available, puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the

container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT

≤ 28 gallons per complete package

Non Regulated

> 28 but ≤ 925 gallons per complete package

UN 3082, Environmentally hazardous substance, liquid, n.o.s.
(2,4-D salt), 9, III, RQ

>925 gallons per complete package

UN 3082, Environmentally hazardous substance, liquid, n.o.s.
(2,4-D salt), 9, III, RQ

IMDG

UN 3082, Environmentally hazardous substances, liquid, n.o.s. (DMA Salt of 2,4-D), 9, III, Marine Pollutant

IATA

UN 3082, Environmentally hazardous substances, liquid, n.o.s. (DMA Salt of 2,4-D), 9, III

15. REGULATORY INFORMATION

EPA FIFRA INFORMATION

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

DANGER. Corrosive. Causes irreversible eye damage. Harmful if swallowed. Do not get in eyes or on clothing.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Acute Health

Section 313 Toxic Chemical(s):

Dimethylamine Dicamba (CAS No. 2300-66-5) 11.8 – 13.0 % by weight in product

Reportable Quantity (RQ) under U.S. CERCLA:

None specified

RCRA Waste Code:

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:

Check individual state requirements.

California Proposition 65: Not listed

16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 3 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

SAFETY DATA SHEET

Weedmaster® Herbicide

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: April 4, 2015

Supersedes: October 1, 2014

Weedmaster is a trademark of Nufarm Americas Inc.

Hexazinone & Sulfometuron Methyl

Brands: Oustar

Signal Word: **DANGER**

Use Statement: GENERAL USE



OUSTAR® HERBICIDE

Version 2.0 / USA
102000030337

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Revision Date: 09/01/2015
Print Date: 09/01/2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name OUSTAR® HERBICIDE

Product code (UVP) 84060348

SDS Number 102000030337

EPA Registration No. 432-1553

Relevant identified uses of the substance or mixture and uses advised against

Use Herbicide

Restrictions on use See product label for restrictions.

Information on supplier

Supplier Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
United States

Responsible Department Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days) 1-800-334-7577

Product Information Telephone Number 1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Serious eye damage: Category 1

Acute toxicity(Oral): Category 4



Signal word: Danger

Hazard statements

Causes serious eye damage.

Harmful if swallowed.

Precautionary statements

Wear eye protection/face protection.

Wash thoroughly after handling.



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Do not eat, drink or smoke when using this product.
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/physician.
IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.
Rinse mouth.
Dispose of contents/container in accordance with local regulation.

Other hazards

No other hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Hexazinone	51235-04-2	63.2
SULFOMETURON METHYL	74222-97-2	11.8

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. 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. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms	To date no symptoms are known.
Indication of any immediate medical attention and special treatment needed	
Treatment	Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.



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SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable Water spray, Dry chemical, Foam, Carbon dioxide (CO₂)

Unsuitable None known.

Special hazards arising from the substance or mixture Dangerous gases are evolved in the event of a fire.

Advice for firefighters

Special protective equipment for fire-fighters Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

Further information Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Whenever possible, contain fire-fighting water by diking area with sand or earth.

Flash point not applicable

Autoignition temperature no data available

Lower explosion limit not applicable

Upper explosion limit not applicable

Explosivity no data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.



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SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Ensure adequate ventilation. Handle and open container in a manner as to prevent spillage.

Hygiene measures Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container and out of the reach of children, preferably in a locked storage area. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
Hexazinone	51235-04-2	50ug/m3 (ST ESL)	07 2011	TX ESL
Hexazinone	51235-04-2	5ug/m3 (AN ESL)	07 2011	TX ESL
SULFOMETURON METHYL	74222-97-2	5 mg/m3 (TWA)	02 2012	ACGIH
SULFOMETURON METHYL	74222-97-2	50ug/m3 (ST ESL)	07 2011	TX ESL
SULFOMETURON METHYL	74222-97-2	5ug/m3 (AN ESL)	07 2011	TX ESL
SULFOMETURON METHYL	74222-97-2	3.5 mg/m3 (TWA PEL)	08 2010	US CA OEL
Lactose	64044-51-5	10ug/m3 (AN ESL)	07 2011	TX ESL
Lactose	64044-51-5	100ug/m3 (ST ESL)	07 2011	TX ESL
Barium sulfate (1:1) (Inhalable fraction.)	7727-43-7	5 mg/m3 (TWA)	02 2014	ACGIH
Barium sulfate (1:1) (Respirable.)	7727-43-7	5 mg/m3 (REL)	2010	NIOSH
Barium sulfate (1:1) (Total)	7727-43-7	10 mg/m3 (REL)	2010	NIOSH
Barium sulfate (1:1)	7727-43-7	5 mg/m3	02 2006	OSHA Z1



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(Respirable fraction.)		(PEL)		
Barium sulfate (1:1) (Total dust.)	7727-43-7	15 mg/m3 (PEL)	02 2006	OSHA Z1
Barium sulfate (1:1) (Respirable fraction.)	7727-43-7	5 mg/m3 (TWA)	1989	OSHA Z1A
Barium sulfate (1:1) (Total dust.)	7727-43-7	10 mg/m3 (TWA)	1989	OSHA Z1A
Barium sulfate (1:1) (Total dust.)	7727-43-7	10 mg/m3 (TWA)	06 2008	TN OEL
Barium sulfate (1:1) (Respirable fraction.)	7727-43-7	5 mg/m3 (TWA)	06 2008	TN OEL
Barium sulfate (1:1)	7727-43-7	50ug/m3 (ST ESL)	03 2014	TX ESL
Barium sulfate (1:1)	7727-43-7	5ug/m3 (AN ESL)	03 2014	TX ESL
Sodium benzoate	532-32-1	50ug/m3 (ST ESL)	03 2014	TX ESL
Sodium benzoate	532-32-1	5ug/m3 (AN ESL)	03 2014	TX ESL

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection

When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection

Chemical resistant nitrile rubber gloves

Eye protection

Safety glasses with side-shields

Skin and body protection

Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.
Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white to light brown
Physical State	granular
Odor	slight
Odour Threshold	no data available
pH	8.0 at 1 % (as aqueous solution)



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Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Density	ca. 0.62 g/ml
Bulk density	35 lb/ft ³
Evaporation rate	not applicable
Boiling Point	not applicable
Melting / Freezing Point	not applicable
Water solubility	dispersible
Minimum Ignition Energy	not applicable
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	not applicable
Viscosity	not applicable
Flash point	not applicable
Autoignition temperature	no data available
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition	no data available
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	no data available
Incompatible materials	no data available
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION



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Exposure routes Eye contact, Skin contact, Ingestion, Inhalation

Immediate Effects

Eye Moderate eye irritation.

Skin May cause skin irritation.

Ingestion Harmful if swallowed.

Information on toxicological effects

Acute oral toxicity LD50 (female rat) 1,421 mg/kg
LD50 (male rat) 2,073 mg/kg

Acute inhalation toxicity ATE (rat) > 5.0 mg/l
Exposure time: 4 h
ATE – acute toxicity estimate

Acute dermal toxicity ATE > 5,000 mg/kg
ATE – acute toxicity estimate

Skin irritation Moderate skin irritation. (rabbit)

Eye irritation Irritating to eyes. (rabbit)
The information is derived from the properties of the individual components.

Sensitisation Non-sensitizing. (guinea pig)
The information is derived from the properties of the individual components.

ACGIH

SULFOMETURON METHYL 74222-97-2 Group A4

NTP

None.

IARC

None.

OSHA

None.

Further information

No further toxicological information is available.

SECTION 12: ECOLOGICAL INFORMATION

Chronic toxicity to fish Oncorhynchus mykiss (rainbow trout)
LC50: > 320 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient hexazinone.
Lepomis macrochirus (Bluegill sunfish)



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	LC50: > 116 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient hexazinone.
	Oncorhynchus mykiss (rainbow trout) LC50: > 148 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient sulfometuron methyl.
Chronic toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 152 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient hexazinone.
	EC50 (Daphnia (water flea)): 150 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient sulfometuron methyl.
Toxicity to aquatic plants	ErC50 (Skeletonema costatum) 0.022 mg/l Exposure time: 120 h The value mentioned relates to the active ingredient hexazinone.
	NOEC (Skeletonema costatum) 0.0041 mg/l Exposure time: 120 h The value mentioned relates to the active ingredient hexazinone.
	EC50 (Raphidocelis subcapitata (freshwater green alga)) 0.0046 mg/l Exposure time: 120 h The value mentioned relates to the active ingredient sulfometuron methyl.
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Drift or runoff from treated areas may adversely affect non-target plants. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product Do not contaminate water, food, or feed by disposal.
Dispose of unused product by incineration at a licensed incineration plant, in accordance with all applicable national and local regulations.

Contaminated packaging Consult state and local regulations regarding the proper disposal of container.
Follow advice on product label and/or leaflet.



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RCRA Information

Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR Not dangerous goods / not hazardous material

IMDG

UN number **3077**
Class **9**
Packaging group **III**
Marine pollutant **YES**
Proper shipping name **ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (HEXAZINONE, SULFOMETURON METHYL MIXTURE)**

IATA

UN number **3077**
Class **9**
Packaging group **III**
Environm. Hazardous Mark **YES**
Proper shipping name **ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (HEXAZINONE, SULFOMETURON METHYL MIXTURE)**

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1553

US Federal Regulations

TSCA list

Hexazinone 51235-04-2

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

None.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

Hexazinone 51235-04-2

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause



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reproductive harm.

US State Right-To-Know Ingredients

Hexazinone 51235-04-2 NJ, RI

Canadian Regulations

Canadian Domestic Substance List

None.

Environmental

CERCLA

None.

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Danger!

Hazard statements: Corrosive - causes irreversible eye damage.
Harmful if swallowed.
Do not get in eyes or on clothing.
Wash thoroughly with soap and water after handling.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
CAS-Nr.	Chemical Abstracts Service number
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	US. IARC Monographs on Occupational Exposures to Chemical Agents
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

Bayer Environmental Science

SAFETY DATA SHEET



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NFPA 704 (National Fire Protection Association):

Health - 2 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 2 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Safety Data Sheet.

Revision Date: 09/01/2015

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

Imazapyr & Glyphosate

Brands: Prep-It

Signal Word: CAUTION

Use Statement: GENERAL USE

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

- 1.1 **PRODUCT IDENTIFIER:** EPA REGISTRATION NO. 34704-989
TRADE NAME: PREP-IT® HERBICIDE
- 1.2 **RECOMMENDED USE:** GROUP 2 | 9 HERBICIDES
- 1.3 **SUPPLIER DETAILS:**
LOVELAND PRODUCTS, INC.
P.O. Box 1286 • Greeley, CO 80632-1286
- 1.4 **24 Hour Emergency Phone:** 1-800-424-9300 - **Medical Emergencies:** 1-866-944-8565 – **Product Information:** 1-888-574-2878 (LPI-CUST)
U.S. Coast Guard National Response Center: 1-800-424-8802

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to 29 CFR 1910.1200

Acute Toxicity – Dermal	Category 4	H312
Eye Damage/Irritation	Category 2B	H320

2.2 Label elements



- Signal word: WARNING
- Hazard Statement: H312 – Harmful in contact with skin.
H320 – Causes eye irritation.
- Precautionary Statement: P280 – Wear protective gloves/protective clothing/eye protection/face protection.
(Prevention): P264 – Wash hands thoroughly after handling.
P270 – Do not eat, drink or smoke when using this product.
- Precautionary Statement: P302+P352 – IF ON SKIN: Wash with plenty of soap and water.
(Response): P312 - Call a poison center/doctor/physician if you feel unwell.
P321 – Specific treatment (see First Aid on the product label).
P362 – Take off contaminated clothing and wash it before reuse.
P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Precautionary Statement: (Storage): Note required or not applicable.
- Precautionary Statement: P501 – Dispose of contents/container in accordance with local, state and federal regulations.
(Disposal):

2.3 Other hazards
None known



SAFETY DATA SHEET

SDS NUMBER: 000989-17-LPI

SDS REVISIONS: FORMAT

DATE OF ISSUE: 06/14/17

PREP-IT®
SUPERSEDES: 04/30/12

3. COMPOSITION, INFORMATION ON INGREDIENTS

3.1 Substances

3.2 Mixtures

Classification according to 29 CFR 1910.1200

Chemical Name:	CAS No.	Concentration [%]
Isopropylamine salt of Imazapyr*	81510-83-0	8.36
Isopropylamine salt of Glyphosate**	38641-94-0	22.13
*Other ingredients	n/a	69.51

*Ingredients not specifically listed are non-hazardous or are to be considered proprietary or confidential business information per 29 CFR 1910.1200(i)

4. FIRST AID MEASURES

4.1 Description of First Aid Measures

General Advice: Get medical attention if symptoms occur.

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

4.2 Most Important Symptoms and Effects, Acute and Delayed

Symptoms: Eyes: Causes eye irritation.
Skin: Harmful in contact with skin.

4.3 Immediate Medical Attention and Special Treatment

Treatment: Treat symptomatically. Symptoms may be delayed.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-866-944-8565

Take container, label or product name with you when seeking medical attention.

5. FIRE FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA:

Suitable Extinguishing Media: Use medium appropriate to surrounding fire. Dry chemical, carbon dioxide (CO₂), alcohol foam, foam, water spray or fog.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:

Specific Hazards During Firefighting: Oxides of nitrogen, oxides of carbon and phosphorus oxide may be released.

5.3 SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS

Special Protective Equipment for Firefighters: Self-contained breathing apparatus and full protective gear should be worn in fighting large fires involving chemicals. Use water spray to keep fire exposed containers cool. Keep people away. Isolate fire and deny unnecessary entry.



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6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Personal Precautions: Avoid contact with skin and eyes. Ensure adequate ventilation. Wear suitable protective clothing.

6.2 ENVIRONMENTAL PRECAUTIONS

Environmental Precautions: This product is toxic to plants. Drift and run-off may be hazardous to plants in water adjacent to treated areas. 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 disposing of equipment washwaters or rinsate.

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEAN-UP

Methods for Clean-Up: Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. After removal flush contaminated area thoroughly with water.
Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to Remove residual contamination.
Never return spills to original containers for re-use.

7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:

Advice on Safe Handling: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

7.2 CONDITIONS FOR SAFE STORAGE:

Requirements for Storage Areas and Containers: **DO NOT** store below 10 °F. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS:

OCCUPATIONAL EXPOSURE LIMITS

U.S. Workplace Exposure Level (ACGIH) TLVs

Components	Type	Value
No listings	TLV	

U.S. Workplace Exposure Level (OSHA) PELs

Components	Type	Value
No listings	TLV	

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Specimen
No listings		

8.2 EXPOSURE CONTROLS:

Engineering Measures

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40CFR 170.240 (d)(6)].

Individual Protection Measures:

Eye / Face Protection: Goggles or shielded safety glasses are recommended.

Skin Protection: Long-sleeved shirt and long pants. Chemical-resistant gloves for all mixers and loaders, plus applicators using handheld equipment. Shoes plus socks.

Respiratory Protection: In case of inadequate ventilation or risk of inhalation of mists or vapors, use suitable respiratory equipment such as MSHA/NIOSH TC-84A with NIOSH equipped N, R, or P class filter media. Wear respiratory protection during operations where spraying or misting occurs. If respirators are used, a program should be in place to assure compliance with 29 CFR 1910.134, the OSHA Respiratory Protection standard. Wear air supplied respiratory protection if exposure concentrations are unknown.



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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 APPEARANCE: Liquid
ODOR: Amine.
ODOR THRESHOLD: No data available.
COLOR: Yellowish.
pH: 6.2 – 6.6
MELTING POINT / FREEZING POINT: Freezing point: approximately 0 °C.
BOILING POINT: approximately 100 °C
FLASH POINT: Does not flash.
FLAMMABILITY (solid, gas): No data available.
UPPER / LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: No data available.
VAPOR PRESSURE: approximately 23.3 hPa @ 20 °C.
SOLUBILITY: Soluble.
PARTITION CO-EFFICIENT, n-OCTANOL / WATER: No data available.
AUTO-IGNITION TEMPERATURE: No data available.
DECOMPOSITION TEMPERATURE: No data available.
VISCOSITY: No data available.
SPECIFIC GRAVITY (Water = 1): 1.11 – 1.13 g/ml
DENSITY: 9.26 – 9.43 lbs/gal | 1.11 – 1.13 kg/L

Note: These physical data are typical values based on material tested but may vary from sample to sample.
Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

10. STABILITY AND REACTIVITY

10.1 REACTIVITY
Stable
10.2 CHEMICAL STABILITY
Stable under normal temperature conditions
10.3 POSSIBILITY OF HAZARDOUS REACTIONS
No data available. Will not polymerize.
10.4 CONDITIONS TO AVOID
Sources of ignition. Excessive heat and cold. Prolonged storage.
10.5 INCOMPATIBLE MATERIALS
Strong oxidizing agents and reducing agents.
10.6 HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of nitrogen, oxides of carbon and phosphorus oxide may be released.

11 TOXICOLOGICAL INFORMATION

11.3 LIKELY ROUTES OF EXPOSURE
Eye contact. Skin contact.
LC₅₀ (rat): 4.93 mg/L (4 HR)
LD₅₀ Oral (rat): > 5,000 mg/kg
LD₅₀ Dermal (rat): > 4,000 mg/kg
Acute Toxicity Estimates: No data available
Skin Irritation (rabbit): Not an irritant.
Eye Irritation (rabbit): Causes eye irritation.
Specific Target Organ Toxicity: No data available.
Aspiration: No data available
Skin Sensitization (guinea pig): Not a sensitizer
Carcinogenicity: No data available.
Germ Cell Mutagenicity: No data available
Interactive Effects: None known.



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12 ECOLOGICAL INFORMATION

12.3 ECOTOXICITY

The product is toxic to plants. Information below is based on the active ingredients Imazapyr and Glyphosate.

Ecotoxicological Data

	Species	Test Results
Imazapyr	Oncorhynchus mykiss	> 100 mg/L – 96-hour LC ₅₀
	Daphnia magna	> 100 mg/L – 48-hour EC ₅₀
	Green algae	71 mg/L – EC ₅₀
	Honey bee	> 100 µ/bee – LD ₅₀
Glyphosate	Oncorhynchus mykiss	> 86 mg/L – 96-hour LC ₅₀
	Lepomis macrochirus	> 24 mg/L – 96-hour LC ₅₀
	Daphnia magna	780 mg/L – 48-hour EC ₅₀
	Green algae	12.5 mg/L – EC ₅₀
	Honey bee	> 100 µ/bee – LD ₅₀

Drift or runoff may adversely affect non-target plants.
Do not apply directly to water.
Do not contaminate water when disposing of equipment wash water.
Do not apply when weather conditions favor drift from target area.

12.2 PERSISTENCE AND DEGRADABILITY

Biodegradability: Not readily biodegradable.

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: No data available

12.4 MOBILITY IN SOIL

No data available

12.5 OTHER ADVERSE EFFECTS

Assessment: No data available.

13 DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Wastes may be disposed of on site or at an approved waste disposal facility. Triple rinse (or equivalent), adding rinse water to spray tank. Offer container for recycling or dispose of in a sanitary landfill or by other procedures approved by appropriate authorities. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your state and local ACRC recycler visit the ACRC web page at <http://www.acrecycle.org/>. Do not contaminate water, food or feed by storage or disposal.

14 TRANSPORT INFORMATION

14.3 LAND TRANSPORT

DOT Shipping Description: NOT REGULATED BY DOT

U.S. Surface Freight Classification: COMPOUND, TREE OR WEED KILLING, NOI (NMFC 50320, SUB 2: CLASS: 60)



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15 REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS

NFPA & HMIS Hazard Ratings:

NFPA		HMIS	
2	Health	0	Least
1	Flammability	1	Slight
0	Instability	2	Moderate
		3	High
		4	Severe

SARA Hazard Notification/Reporting

SARA Title III Hazard Category:	Immediate	<u>Y</u>	Fire	<u>N</u>	Sudden Release of Pressure	<u>N</u>
	Delayed	<u>N</u>	Reactive	<u>N</u>		

Reportable Quantity (RQ) under U.S. CERCLA: Not listed
 SARA, Title III, Section 313: Not listed
 RCRA Waste Code: Not listed
 CA Proposition 65: Not listed.

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Causes moderate eye irritation.
 Harmful if absorbed through skin.
 Avoid contact with eyes, skin, or clothing.

16 OTHER INFORMATION

SDS STATUS: Format revised.

PREPARED BY: Registrations and Regulatory Affairs

REVIEWED BY: Environmental Health and Safety

®Prep-It is a registered trademark of Loveland Products, Inc.

*Equivalent to 6.82% (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid) or 0.637 pounds acid per gallon

**Equivalent to 16.40% N-(phosphonomethyl)glycine acid or 1.531 pounds per gallon.

Disclaimer and Limitation of Liability: This data sheet was developed from information on the constituent materials identified herein and does not relate to the use of such materials in combination with any other material or process. No warranty is expressed or implied with respect to the completeness or ongoing accuracy of the information contained in this data sheet, and LOVELAND PRODUCTS, INC. disclaims all liability for reliance on such information. This data sheet is not a guarantee of safety. Users are responsible for ensuring that they have all current information necessary to safely use the product described by this data sheet for their specific purpose.

Imazapyr & Metsulfuron Methyl

Brands: Lineage Clearstand

Signal Word: CAUTION

Use Statement: GENERAL USE



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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name LINEAGE® CLEARSTAND™ HERBICIDE

Product code (UVP) 84069310

SDS Number 102000030345

EPA Registration No. 432-1578

Relevant identified uses of the substance or mixture and uses advised against

Use Herbicide

Restrictions on use See product label for restrictions.

Information on supplier

Supplier Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
United States

Responsible Department Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days) 1-800-334-7577

Product Information Telephone Number 1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Eye irritation: Category 2B

Signal word: Warning

Hazard statements

Causes eye irritation.

Precautionary statements

Wash face, hands and any exposed skin thoroughly after handling.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/ attention.

Other hazards

No other hazards known.

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Print Date: 10/28/2015**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

Hazardous Component Name	CAS-No.	Concentration % by weight
imazapyr	81334-34-1	63.2
Metsulfuron-methyl	74223-64-6	9.5

SECTION 4: FIRST AID MEASURES**Description of first aid measures**

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. 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. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed**Symptoms** No symptoms known or expected.**Indication of any immediate medical attention and special treatment needed****Treatment** Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.**SECTION 5: FIREFIGHTING MEASURES****Extinguishing media**

Suitable	Water spray, Foam, Dry chemical, Carbon dioxide (CO ₂)
Unsuitable	High volume water jet



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Advice for firefighters

Special protective equipment for fire-fighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point	not applicable
Autoignition temperature	no data available
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available
Dust explosion class	no data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions	Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.
Methods and materials for containment and cleaning up	
Methods for cleaning up	Avoid dust formation. Use approved industrial vacuum cleaner for removal. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.
Additional advice	Do not allow to enter soil, waterways or waste water canal.
Reference to other sections	Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	Handle and open container in a manner as to prevent spillage. Avoid dust formation. Use only in area provided with appropriate exhaust ventilation.
Hygiene measures	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.



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Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

No control parameters known.

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection Chemical resistant nitrile rubber gloves

Eye protection Safety glasses with side-shields

Skin and body protection Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.
Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white to light brown
Physical State	solid granular
Odor	very faint
Odour Threshold	no data available
pH	5.2 - 6.0
Vapor Pressure	no data available
Vapor Density (Air = 1)	no data available
Bulk density	530 - 590 kg/m ³

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Evaporation rate	not applicable
Boiling Point	not applicable
Melting / Freezing Point	not applicable
Water solubility	dispersible
Minimum Ignition Energy	no data available
Decomposition temperature	no data available
Partition coefficient: n-octanol/water	not applicable
Viscosity	not applicable
Flash point	not applicable
Autoignition temperature	no data available
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Explosivity	no data available
Dust explosion class	no data available

SECTION 10: STABILITY AND REACTIVITY**Reactivity**

Thermal decomposition	no data available
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	no data available
Incompatible materials	no data available
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Skin Absorption, Eye contact, Inhalation, Ingestion
Immediate Effects	

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Eye Moderate eye irritation.
Skin Harmful if absorbed through skin.

Inhalation Avoid breathing spray mist.

Information on toxicological effects

Acute oral toxicity LD50 (rat) > 5,000 mg/kg
Acute inhalation toxicity LC50 (rat) > 5.1 mg/l
Exposure time: 4 h
Acute dermal toxicity LD50 (rabbit) > 2,000 mg/kg
Skin irritation Irritating to skin. (rat)
Eye irritation Moderate eye irritation. (rabbit)
Sensitisation Non-sensitizing. (guinea pig)

ACGIH

None.

NTP

None.

IARC

None.

OSHA

None.

Further information

Only acute toxicity studies have been performed on the formulated product.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish LC50 (Oncorhynchus mykiss (rainbow trout)) > 100 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient imazapyr.
LC50 (Lepomis macrochirus (Bluegill sunfish)) > 100 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient imazapyr.
LC50 (Oncorhynchus mykiss (rainbow trout)) > 150 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient metsulfuron methyl.
LC50 (Lepomis macrochirus (Bluegill sunfish)) > 150 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient metsulfuron methyl.



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Toxicity to aquatic invertebrates	<p>EC50 (Daphnia magna (Water flea)) > 100 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient imazapyr.</p> <p>EC50 (Daphnia magna (Water flea)) > 120 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient metsulfuron methyl.</p>
Toxicity to aquatic plants	<p>EC50 (Anabaena flos-aquae (cyanobacterium)) 0.066 mg/l Exposure time: 72 h The value mentioned relates to the active ingredient metsulfuron methyl.</p> <p>EC50 (Lemna minor (Common duck-weed)) 0.00036 mg/l Exposure time: 14 d The value mentioned relates to the active ingredient metsulfuron methyl.</p>
Environmental precautions	<p>Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not allow to get into surface water, drains and ground water. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Apply this product as specified on the label.</p>

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product Do not contaminate water, food, or feed by disposal.
Dispose in accordance with all local, state/provincial and federal regulations.
Follow container label instructions for disposal of wastes generated during use in compliance with the product label.

Contaminated packaging Do not re-use empty containers.
Triple rinse containers.
Completely empty container into application equipment, then dispose of empty container in a sanitary landfill, by incineration or by other procedures approved by state/provincial and local authorities.
If burned, stay out of smoke.
Follow advice on product label and/or leaflet.

RCRA Information Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR Not dangerous goods / not hazardous material



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IMDG

UN number	3077
Class	9
Packaging group	III
Marine pollutant	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (METSULFURON-METHYL MIXTURE)

IATA

UN number	3077
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (METSULFURON-METHYL MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1578

US Federal Regulations

TSCA list

None.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

None.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

None.

Canadian Regulations

Canadian Domestic Substance List

None.



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Environmental

CERCLA

None.

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Harmful if absorbed through skin.
Moderate eye irritation.
Avoid contact with skin, eyes and clothing.
Avoid breathing spray mist.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
CAS-Nr.	Chemical Abstracts Service number
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	US. IARC Monographs on Occupational Exposures to Chemical Agents
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

Bayer Environmental Science

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NFPA 704 (National Fire Protection Association):

Health - 2 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Safety Data Sheet.

Revision Date: 10/28/2015

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

Oxyflurofen & Penoxsulam

Brands: Cleantraxx

Signal Word: CAUTION

Use Statement: GENERAL USE

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: CLEANTRAXX™ Herbicide

Issue Date: 05/14/2015

Print Date: 03/08/2016

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: CLEANTRAXX™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component

CASRN

Concentration

Oxyfluorfen

42874-03-3

40.31%

Penoxsulam	219714-96-2	0.85%
Propylene glycol	57-55-6	>= 0.05 - <= 9.7 %
Balance	Not available	>= 49.14 - <= 58.79 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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

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

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Ingestion: No emergency medical treatment necessary.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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

Unusual Fire and Explosion Hazards: This material does not burn. In a fire situation, residue can burn.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

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

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

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Oxyfluorfen	Dow IHG	TWA	0.2 mg/m ³
Propylene glycol	US WEEL	TWA	10 mg/m ³

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

Exposure controls

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

Individual protection measures

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

Skin protection

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Other protection: No precautions other than clean body-covering clothing should be needed.

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 material is heated or sprayed, use an approved air-purifying respirator.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow
Odor	Mild
Odor Threshold	no data available
pH	6.1 1% <i>pH Electrode</i> (1% aqueous suspension)
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	No test data available
Flash point	closed cup > 100 °C (> 212 °F) <i>Closed Cup</i>
Evaporation Rate (Butyl Acetate = 1)	no data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	No test data available
Relative Vapor Density (air = 1)	No test data available
Relative Density (water = 1)	No test data available
Water solubility	No test data available
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available

Kinematic Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	1.177 g/cm ³ at 20 °C (68 °F) <i>Digital density meter</i>
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

Incompatible materials: Avoid contact with: Oxidizers.

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

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity

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

As product:

LD50, Rat, female, > 5,000 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity

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

As product:

LD50, Rat, male and female, > 5,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous.

Skin corrosion/irritation

Essentially nonirritating to skin.

Serious eye damage/eye irritation

May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization

As product:

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

Specific Target Organ Systemic Toxicity (Single Exposure)

Product test data not available.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

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

Adrenal gland.

Blood.

Kidney.

Liver.

Spleen.

Carcinogenicity

For the active ingredient(s): Oxyfluorfen. Has caused cancer in laboratory animals. Penoxsulam. Did not cause cancer in laboratory animals.

Teratogenicity

For the active ingredient(s): Oxyfluorfen. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity

For the active ingredient(s): Oxyfluorfen. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Penoxsulam. In animal studies, did not interfere with reproduction.

Mutagenicity

Based on information for component(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

Product test data not available.

COMPONENTS INFLUENCING TOXICOLOGY:

Oxyfluorfen

Acute inhalation toxicity

At room temperature, exposure to vapor is minimal due to low volatility. No adverse effects are anticipated from single exposure to dust. For respiratory irritation: For narcotic effects: Relevant data not available.

LC50, Rat, 4 Hour, dust/mist, > 3.71 mg/l The LC50 value is greater than the Maximum Attainable Concentration. No deaths occurred at this concentration.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Aspiration Hazard

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

Penoxsulam

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

Maximum attainable concentration. LC50, Rat, male and female, 4 Hour, dust/mist, > 3.50 mg/l No deaths occurred at this concentration.

Aspiration Hazard

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

Propylene glycol

Acute inhalation toxicity

Mist may cause irritation of upper respiratory tract (nose and throat). LC50, Rabbit, 2 Hour, Aerosol, 317.042 mg/l No deaths occurred at this concentration.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Aspiration Hazard

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

Balance

Acute inhalation toxicity

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

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

Toxicity

Oxyfluorfen

Acute toxicity to fish

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50, Rainbow trout (*Oncorhynchus mykiss*), static test, 96 Hour, 0.25 mg/l

Acute toxicity to aquatic invertebrates

EC50, water flea *Daphnia magna*, 48 Hour, 0.072 mg/l

Acute toxicity to algae/aquatic plants

EbC50, diatom *Navicula* sp., static test, 96 Hour, Biomass, 0.031 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, *Pimephales promelas* (fathead minnow), flow-through test, 33 d, survival, 0.038 mg/l
NOEC, *Pimephales promelas* (fathead minnow), flow-through test, 265 d, survival, 0.005 mg/l
NOEC, *Cyprinodon variegatus* (sheepshead minnow), flow-through test, 34 d, growth, 0.0047 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, water flea *Daphnia magna*, flow-through test, 21 d, 0.013 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).
LD50, *Colinus virginianus* (Bobwhite quail), > 2,150 mg/kg
LC50, *Anas platyrhynchos* (Mallard duck), 8 d, > 5,000 mg/kg
oral LD50, *Apis mellifera* (bees), 48 Hour, > 100micrograms/bee
contact LD50, *Apis mellifera* (bees), 48 Hour, > 100.0micrograms/bee
dietary LC50, *Colinus virginianus* (Bobwhite quail), > 5,000 mg/kg

Penoxsulam

Acute toxicity to fish

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).
LC50, *Oncorhynchus mykiss* (rainbow trout), static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), static test, 48 Hour, > 100 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

ErC50, *Pseudokirchneriella subcapitata* (green algae), static test, 72 Hour, Growth rate inhibition, 0.126 mg/l, OECD Test Guideline 201
EbC50, *Lemna minor* (duckweed), 14 d, Biomass, 0.00329 mg/l, OECD 221.

Toxicity to bacteria

EC50, activated sludge, 3 Hour, > 1,000 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).
oral LD50, *Anas platyrhynchos* (Mallard duck), mortality, > 2000mg/kg bodyweight.
dietary LC50, *Colinus virginianus* (Bobwhite quail), 8 d, mortality, > 5063mg/kg diet.
contact LD50, *Apis mellifera* (bees), 48 Hour, mortality, > 100µg/bee
oral LD50, *Apis mellifera* (bees), 48 Hour, mortality, > 100µg/bee

Toxicity to soil-dwelling organisms

LC50, *Eisenia fetida* (earthworms), 14 d, > 1,000 mg/kg
NOEC, *Eisenia fetida* (earthworms), 56 d, 1,000 mg/kg

Propylene glycol

Acute toxicity to fish

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), static test, 96 Hour, 40,613 mg/l, OECD Test Guideline 203

Acute toxicity to aquatic invertebrates

LC50, Ceriodaphnia dubia (water flea), static test, 48 Hour, 18,340 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Growth rate inhibition, 19,000 mg/l, OECD Test Guideline 201

Toxicity to bacteria

NOEC, Pseudomonas putida, 18 Hour, > 20,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Ceriodaphnia dubia (water flea), semi-static test, 7 d, number of offspring, 13,020 mg/l

Balance**Acute toxicity to fish**

No relevant data found.

Persistence and degradability**Oxyfluorfen**

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

Theoretical Oxygen Demand: 1.305 mg/mg

Stability in Water (1/2-life)

Hydrolysis, 3.9 d, pH 5 - 9, Half-life Temperature 20 °C

Penoxsulam

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

10-day Window: Fail

Biodegradation: 14.7 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Photodegradation

Sensitizer: OH radicals

Atmospheric half-life: 2.1 Hour

Method: Estimated.

Propylene glycol

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

10-day Window: Pass

Biodegradation: 81 %

Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent
 10-day Window: Not applicable
Biodegradation: 96 %
Exposure time: 64 d
Method: OECD Test Guideline 306 or Equivalent

Theoretical Oxygen Demand: 1.68 mg/mg

Chemical Oxygen Demand: 1.53 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	69.000 %
10 d	70.000 %
20 d	86.000 %

Photodegradation
Atmospheric half-life: 10 Hour
Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Oxyfluorfen

Bioconcentration factor (BCF): 184 - 1,151 *Lepomis macrochirus* (Bluegill sunfish) 168 Hour

Penoxsulam

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.602 Measured

Propylene glycol

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -1.07 Measured
Bioconcentration factor (BCF): 0.09 Estimated.

Balance

Bioaccumulation: No relevant data found.

Mobility in soil

Oxyfluorfen

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient(Koc): 6831

Penoxsulam

Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient(Koc): 73 Measured

Propylene glycol

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).

Partition coefficient(Koc): < 1 Estimated.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Oxyfluorfen)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	Oxyfluorfen
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(Oxyfluorfen)
UN number	UN 3082
Class	9
Packing group	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional

transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components

Oxyfluorfen

CASRN

42874-03-3

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components

Propylene glycol

CASRN

57-55-6

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-702

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

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
1	1	1

Revision

Identification Number: 101223680 / A211 / Issue Date: 05/14/2015 / Version: 2.0

DAS Code: GF-2214

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

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	8-hr TWA
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

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.

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

Picloram & 2,4-D

Brands: Graslán L, Tordon 101, Pathway, Picloram Plus D, Trooper P+D

Signal Word: **DANGER**

Use Statement: **RESTRICTED USE**

SAFETY DATA SHEET

DOW AGROSCIENCES LLC

Product name: TORDON™ 101 Herbicide Mixture

Issue Date: 05/04/2015

Print Date: 05/07/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: TORDON™ 101 Herbicide Mixture

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number:

800-992-5994

info@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Eye irritation - Category 2A

Skin sensitisation - Category 1

Label elements

Hazard pictograms



Signal word: **WARNING!**

Hazards

May cause an allergic skin reaction.
Causes serious eye irritation.

Precautionary statements**Prevention**

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.
Wear eye protection/ face protection.
Wear protective gloves.

Response

IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Wash contaminated clothing before reuse.

Disposal

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

Other hazards

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt	18584-79-7	39.6%
Picloram triisopropanolamine salt	6753-47-5	10.2%
Alkylphenol alkoxybate	69029-39-6	5.1%
isopropanol	67-63-0	1.6%
Triisopropanolamine	122-20-3	1.0%
Balance	Not available	42.5%

4. FIRST AID MEASURES

Description of first aid measures

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

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

Skin contact: Take off contaminated clothing. 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.

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 work area.

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

Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

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

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

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause

environmental damage. Review the “Accidental Release Measures” and the “Ecological Information” sections of this (M)SDS.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Ventilate area of leak or spill. Keep upwind of spill. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to section 7, Handling, for additional precautionary measures.

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

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

7. HANDLING AND STORAGE

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

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Alkylphenol alkoxylate isopropanol	Dow IHG	TWA	2 mg/m ³
	ACGIH	TWA	200 ppm
	ACGIH	STEL	400 ppm
Triisopropanolamine	OSHA Z-1	TWA	980 mg/m ³ 400 ppm
	Dow IHG	TWA	10 mg/m ³

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

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

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

Other protection: 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.

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, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow to brown
Odor	Alcohols
Odor Threshold	no data available
pH	6.8 - 7.8 <i>pH Electrode</i>
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	82 °C (180 °F)
Flash point	closed cup > 100 °C (> 212 °F) <i>Setaflash Closed Cup ASTM D3828</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	32 hPa at 20 °C (68 °F)
Relative Vapor Density (air = 1)	Not applicable

Relative Density (water = 1)	1.143 at 20 °C (68 °F) <i>Literature</i>
Water solubility	Soluble
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	No test data available
Kinematic Viscosity	No test data available
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	1.149 g/cm ³ at 20 °C (68 °F)
Molecular weight	no data available

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

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

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

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

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Single dose oral LD50 has not been determined. For similar material(s):
LD50, Rat, 2,598 mg/kg

Acute dermal toxicity

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

The dermal LD50 has not been determined. For similar material(s):
LD50, Rabbit, > 5,000 mg/kg

Acute inhalation toxicity

Prolonged excessive exposure may cause adverse effects. Based on the available data, respiratory irritation was not observed.

The LC50 has not been determined. For similar material(s): Maximum attainable concentration.
LC50, Rat, 4 Hour, dust/mist, > 1.38 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin.
Prolonged contact may cause slight skin irritation with local redness.
Repeated contact may cause slight skin irritation with local redness.

Serious eye damage/eye irritation

May cause moderate eye irritation.
May cause slight corneal injury.
Effects may be slow to heal.

Sensitization

For similar material(s):
Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

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

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Eye.
Thyroid.
Observations in animals include:
Nausea and/or vomiting.

Carcinogenicity

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

For similar active ingredient(s). Various animal cancer tests have shown no reliably positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative.

Teratogenicity

For the active ingredient(s): 2,4-Dichlorophenoxyacetic acid, Triisopropanolamine salt Has caused birth defects in lab animals only at doses producing severe toxicity in the mother. For the minor component(s): Isopropanol has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive toxicity

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.

Mutagenicity

For the component(s) tested: In vitro genetic toxicity studies were negative. For the majority of components: Animal genetic toxicity studies were negative.

Aspiration Hazard

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

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity**2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt****Acute toxicity to fish**

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), static test, 96 Hour, 317 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 48 Hour, 748 mg/l

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 5 d, 103 mg/l

EC50, Lemna minor (duckweed), 14 d, 2.37 mg/l

Toxicity to Above Ground Organisms

Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

oral LD50, Colinus virginianus (Bobwhite quail), 405 mg/kg

dietary LC50, Colinus virginianus (Bobwhite quail), > 5,620 ppm

Picloram triisopropanolamine salt**Acute toxicity to fish**

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), static test, 96 Hour, 51 mg/l

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 48 Hour, 125 mg/l

Chronic toxicity to fish

NOEC, Pimephales promelas (fathead minnow), 28 d, 7.19 mg/l

Alkylphenol alkoxylate**Acute toxicity to fish**

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), static test, 96 Hour, 3.7 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), 48 Hour, 10.5 mg/l, OECD Test Guideline 202 or Equivalent

Toxicity to Above Ground Organisms

dietary LC50, Apis mellifera (bees), 2 d, > 105micrograms/bee
contact LD50, Apis mellifera (bees), 2 d, > 100micrograms/bee
oral LD50, Colinus virginianus (Bobwhite quail), > 2,250 mg/kg

isopropanol**Acute toxicity to fish**

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

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 9,640 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

NOEC, alga Scenedesmus sp., static test, 7 d, Growth inhibition (cell density reduction), 1,800 mg/l

ErC50, alga Scenedesmus sp., static test, 72 Hour, Growth rate inhibition, > 1,000 mg/l

Toxicity to bacteria

EC50, activated sludge, > 1,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, 30 mg/l

Triisopropanolamine**Acute toxicity to fish**

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, Leuciscus idus (Golden orfe), static test, 96 Hour, 3,158.4 mg/l, DIN 38412

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 500 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

EC50, alga Scenedesmus sp., static test, 72 Hour, Growth rate inhibition, 710 mg/l, EU Method C.3 (Algal Inhibition test)

Toxicity to bacteria

EC10, activated sludge, 30 min, > 1,195 mg/l

Balance

Acute toxicity to fish

No relevant data found.

Persistence and degradability

2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt

Biodegradability: For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Picloram triisopropanolamine salt

Biodegradability: For similar active ingredient(s). Picloram. Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Biodegradation may occur under aerobic conditions (in the presence of oxygen). Surface photodegradation is expected with exposure to sunlight.

Alkylphenol alkoxyate

Biodegradability: Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Theoretical Oxygen Demand: 2.35 mg/mg

Chemical Oxygen Demand: 1.78 mg/mg

isopropanol

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

10-day Window: Pass

Biodegradation: 95 %

Exposure time: 21 d

Method: OECD Test Guideline 301E or Equivalent

10-day Window: Pass

Biodegradation: 53 %

Exposure time: 5 d

Method: Other guidelines

Theoretical Oxygen Demand: 2.40 mg/mg Estimated.

Chemical Oxygen Demand: 2.09 mg/mg Estimated.

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	20 - 72 %
20 d	78 - 86 %

Photodegradation**Test Type:** Half-life (indirect photolysis)**Sensitizer:** OH radicals**Atmospheric half-life:** 1.472 d**Method:** Estimated.**Triisopropanolamine****Biodegradability:** Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Biodegradation rate may increase in soil and/or water with acclimation. Material is not readily biodegradable according to OECD/EEC guidelines.

10-day Window: Fail

Biodegradation: 0 %**Exposure time:** 28 d**Method:** OECD Test Guideline 301F or Equivalent**Theoretical Oxygen Demand:** 2.35 mg/mg**Photodegradation****Test Type:** Half-life (indirect photolysis)**Sensitizer:** OH radicals**Atmospheric half-life:** 3 Hour**Method:** Estimated.**Balance****Biodegradability:** No relevant data found.**Bioaccumulative potential****2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt****Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility. For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Picloram triisopropanolamine salt****Bioaccumulation:** No data available for this product. For similar active ingredient(s). Picloram. Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).**Alkylphenol alkoxyate****Bioaccumulation:** No bioconcentration is expected because of the relatively high water solubility. May foam in water.**isopropanol****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** 0.05 Measured**Triisopropanolamine****Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).**Partition coefficient: n-octanol/water(log Pow):** -0.015 at 23 °C Measured**Bioconcentration factor (BCF):** < 0.57 Fish. 42 d Measured**Balance****Bioaccumulation:** No relevant data found.

Mobility in soil**2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt**

For similar active ingredient(s).
2,4-Dichlorophenoxyacetic acid.
Potential for mobility in soil is very high (Koc between 0 and 50).

Picloram triisopropanolamine salt

For similar active ingredient(s).
Picloram.
Potential for mobility in soil is very high (Koc between 0 and 50).

Alkylphenol alkoxyate

No data available.

isopropanol

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 1.1 Estimated.

Triisopropanolamine

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient(Koc): 10 Estimated.

Balance

No relevant data found.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(2,4-D Salt)
UN number	UN 3082
Class	9
Packing group	III
Reportable Quantity	2,4-D Salt

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

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

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

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

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Components

isopropanol

CASRN

67-63-0

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number: 62719-005

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:

DANGER

Corrosive
Causes irreversible eye damage
Harmful if swallowed or inhaled
Harmful if absorbed through skin

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity
1	1	0

Revision

Identification Number: 101192176 / A211 / Issue Date: 05/04/2015 / Version: 3.0

DAS Code: GF-2179

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

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
Dow IHG	Dow Industrial Hygiene Guideline
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

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.

DOW AGROSCIENCES LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with

all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

Sulfometuron Methyl & Metsulfuron Methyl

Brands: Oust Extra, SFM Extra, Spyder Extra

Signal Word: **CAUTION**

Use Statement: GENERAL USE

SAFETY DATA SHEET



OUST® EXTRA HERBICIDE

Version 1.0 / USA
102000033583

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Revision Date: 08/07/2018
Print Date: 08/07/2018

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name OUST® EXTRA HERBICIDE

Product code (UVP) 85423010

SDS Number 102000033583

EPA Registration No. 432-1557

Relevant identified uses of the substance or mixture and uses advised against

Use Herbicide

Restrictions on use See product label for restrictions.

Information on supplier

Supplier Bayer Environmental Science
2 T.W. Alexander Drive
Research Triangle PK, NC 27709
USA

Responsible Department Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days) 1-800-334-7577

Product Information Telephone Number 1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200

Eye irritation: Category 2B

Labelling in accordance with regulation HCS 29CFR §1910.1200

Signal word: Warning

Hazard statements

Causes eye irritation.

Precautionary statements

Wash thoroughly after handling.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/ attention.

Hazards Not Otherwise Classified (HNOC)

No physical hazards not otherwise classified.

No health hazards not otherwise classified.

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
SULFOMETURON METHYL	74222-97-2	56.25
Metsulfuron-methyl	74223-64-6	15.0
Trisodium orthophosphate	7601-54-9	1.76
Sulfonated aromatic polymer, sodium salt	68425-94-5	4.5

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
Inhalation	Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
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 physician or poison control center immediately.
Ingestion	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. 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. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms	To date no symptoms are known.
Indication of any immediate medical attention and special treatment needed	
Treatment	Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended. There is no specific antidote.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable	Water spray, Foam, Dry chemical, Carbon dioxide (CO ₂)
Unsuitable	High volume water jet

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Advice for firefighters

Special protective equipment for firefighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point	Not applicable
Auto-ignition temperature	No data available
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	Not explosive
Dust explosion class	No data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.

Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Avoid dust formation. Use only in area provided with appropriate exhaust ventilation. Handle and open container in a manner as to prevent spillage.

Hygiene measures Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.

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Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
SULFOMETURON METHYL	74222-97-2	5 mg/m ³ (TWA)	02 2012	ACGIH
SULFOMETURON METHYL	74222-97-2	3.5 mg/m ³ (TWA PEL)	08 2010	US CA OEL
Trisodium orthophosphate	7601-54-9	5 mg/m ³ (STEL)	2012	WEEL

Exposure controls

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection Chemical resistant nitrile rubber gloves

Eye protection Safety glasses with side-shields

Skin and body protection Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.
Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance light beige

Physical State small rod

Odor slight

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Odour Threshold	No data available
pH	>= 5.5 at 1 % (23 °C) (deionized water)
Vapor Pressure	No data available
Vapor Density (Air = 1)	No data available
Bulk density	0.50 - 0.70 g/ml (loose)
Evaporation rate	Not applicable
Boiling Point	Not applicable
Melting / Freezing Point	Not applicable
Water solubility	dispersible
Minimum Ignition Energy	Not applicable
Decomposition temperature	No data available
Partition coefficient: n-octanol/water	Not applicable
Flash point	Not applicable
Auto-ignition temperature	No data available
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	Not explosive
Dust explosion class	No data available

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Thermal decomposition	No data available
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	No data available
Incompatible materials	No data available
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

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Print Date: 08/07/2018

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes Skin Absorption, Eye contact, Inhalation, Ingestion

Immediate Effects

Eye Moderate eye irritation.

Skin Harmful if absorbed through skin.

Information on toxicological effects

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

Acute inhalation toxicity LC50 (Rat) 5.3 mg/l
Exposure time: 4 h

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

Skin corrosion/irritation slight irritation (Rabbit)

Serious eye damage/eye irritation slight irritation (Rabbit)

Respiratory or skin sensitisation Non-sensitizing. (Guinea pig)

Assessment STOT Specific target organ toxicity – repeated exposure

Metsulfuron-methyl: Based on available data, the classification criteria are not met.

Assessment mutagenicity

Metsulfuron-methyl: Based on available data, the classification criteria are not met. Not mutagenic in Ames Test.

Assessment carcinogenicity

Metsulfuron-methyl is not considered carcinogenic.

ACGIH

SULFOMETURON METHYL 74222-97-2 Group A4

NTP

None.

IARC

None.

OSHA

None.

Assessment toxicity to reproduction

Metsulfuron-methyl did not cause reproductive toxicity in laboratory animals.

Assessment developmental toxicity

Metsulfuron-methyl is not considered a developmental toxicant.

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Further information

Only acute toxicity studies have been performed on the formulated product.
The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) > 148 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient sulfometuron methyl. LC50 (Oncorhynchus mykiss (rainbow trout)) > 150 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)) > 150 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient sulfometuron methyl. EC50 (Daphnia magna (Water flea)) > 120 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic plants	EC50 (Anabaena flos-aquae (cyanobacterium)) 0.066 mg/l Exposure time: 72 h The value mentioned relates to the active ingredient metsulfuron methyl.
Biodegradability	Metsulfuron-methyl: No data available
Koc	Metsulfuron-methyl: No data available
Bioaccumulation	Metsulfuron-methyl: No data available
Mobility in soil	Metsulfuron-methyl: No data available
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not allow to get into surface water, drains and ground water. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product Do not contaminate water, food, or feed by disposal.
Dispose in accordance with all local, state/provincial and federal

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	regulations. Follow container label instructions for disposal of wastes generated during use in compliance with the product label.
Contaminated packaging	Consult state and local regulations regarding the proper disposal of container. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR	Not dangerous goods / not hazardous material
IMDG	
UN number	3077
Class	9
Packaging group	III
Marine pollutant	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (SULFOMETURON METHYL, METSULFURON METHYL MIXTURE)
IATA	
UN number	3077
Class	9
Packaging group	III
Environm. Hazardous Mark	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (SULFOMETURON METHYL, METSULFURON METHYL MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15: REGULATORY INFORMATION

EPA Registration No.	432-1557
US Federal Regulations	
TSCA list	
Trisodium orthophosphate	7601-54-9
Sulfonated aromatic polymer, sodium salt	68425-94-5
Sucrose	57-50-1

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US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

Not applicable.

SARA Title III - Section 302 - Notification and Information

None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting

None.

US States Regulatory Reporting

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

Trisodium orthophosphate	7601-54-9	CA, CT, IL, MN, NJ
Polyvinylpyrrolidone	9003-39-8	CA
Sucrose	57-50-1	MN, RI
Polyethylene glycol	25322-68-3	MN

EPA/FIFRA Information:

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 required on the pesticide label:

Signal word: Caution!

Hazard statements: Harmful if absorbed through skin.
Moderate eye irritation.
Avoid contact with skin, eyes and clothing.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development

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TDG Transportation of Dangerous Goods
TWA Time weighted average
UN United Nations
WHO World health organisation

NFPA 704 (National Fire Protection Association):

Health - 1 Flammability - 1 Instability - 0 Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1 Flammability - 1 Physical Hazard - 0 PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Safety Data Sheet due to change in numbering scheme.

Revision Date: 08/07/2018

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