

CleanStart[®]

Herbicide Tank Mix

- Aim[®] EC Herbicide (PCP No 28573)
- Credit[®] Liquid Herbicide (PCP No 25866)



Nufarm

Grow a better tomorrow.

MATERIAL SAFETY DATA SHEET
AIM® EC HERBICIDE

MSDS #: 6165-A
Revision date: 2015-03-06
Version 1.04



This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200
And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	AIM® EC HERBICIDE
Formula code	006165
Active Ingredient(s)	Carfentrazone-ethyl
Synonyms	CARFENTRAZONE-ETHYL (FMC 116426): ethyl (RS)-2-chloro-3-[2-chloro-5-(4-difluoromethyl-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl)-4-fluorophenyl] propionate; ethyl α ,2-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]-4-fluorobenzenepropanoate
Chemical Family	Triazolinones
Recommended Use:	Herbicide
<u>Manufacturer/Supplier</u>	<u>Emergency telephone number</u>
FMC Corporation Agricultural Solutions 1735 Market Street Philadelphia, PA 19103 General Information: Phone: (215) 299-6000 E-Mail: msdsinfo@fmc.com	Medical Emergencies: 1 800 / 331-3148 (PROSAR - U.S.A. & Canada) 1 651 / 632-6793 (PROSAR - All Other Countries - Collect) For leak, fire, spill or accident emergencies, call: 1 800 / 424 9300 (CHEMTREC - U.S.A.) 1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

<u>Appearance</u>	Brown orange liquid
<u>Physical State</u>	Liquid
<u>Odor</u>	Aromatic
<u>Potential Health Effects</u>	
Principal Routes of Exposure	Eye Contact, Skin Contact, Inhalation, Ingestion
Acute Effects	
Eyes	May cause slight irritation.
Skin	Substance may cause slight skin irritation.
Inhalation	May cause irritation of respiratory tract. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.
Ingestion	Potential for aspiration if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause central nervous system depression.
Chronic Effects	Carfentrazone-ethyl: Long-term exposure caused hematotoxicity and deposit of porphyrin in the liver in animal studies.

Environmental Hazard

See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS**Hazardous ingredients**

Chemical name	CAS-No	Weight %
Carfentrazone-ethyl	128639-02-1	21.9
Naphtha (petroleum), heavy aromatic	64742-94-5	60-70
2-Methylnaphthalene	91-57-6	20-30
1-Methylnaphthalene	90-12-0	10-20
Naphthalene	91-20-3	0.1-1

4. FIRST AID MEASURES

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 further treatment advice.
Eye Contact	Hold eyes 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 further treatment advice.
Inhalation	Move person to fresh air. If person is not breathing, call 911 (within the U.S. and Canada) 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.
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 induce vomiting or give anything by mouth to an unconscious person.
Notes to Physician	Treatment is symptomatic and supportive. Contains petroleum distillate. Vomiting may cause aspiration pneumonia.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Water spray. Carbon dioxide (CO ₂). Foam. Dry powder.
Hazardous Combustion Products	None known.
Specific Hazards Arising from the Chemical	Slightly combustible. May support combustion at elevated temperatures.
Protective equipment and precautions for firefighters	Wear self-contained breathing apparatus and protective suit.

NFPA

Health Hazards	1
Flammability	2
Stability	0
Special Hazards	-

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.
Environmental Precautions	Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains. See Section 12 for additional Ecological Information.
Methods for Containment	Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
Methods for cleaning up	Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.
Other	For further clean-up instructions, call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

7. HANDLING AND STORAGE

Handling	Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.
Storage	Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Keep/store only in original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
2-Methylnaphthalene 91-57-6	S* TWA: 0.5 ppm			
1-Methylnaphthalene 90-12-0	S* TWA: 0.5 ppm			
Naphthalene 91-20-3	S* TWA: 10 ppm	TWA: 10 ppm TWA: 50 mg/m ³	IDLH: 250 ppm TWA: 10 ppm TWA: 50 mg/m ³ STEL: 15 ppm STEL: 75 mg/m ³	Mexico: TWA 10 ppm Mexico: TWA 50 mg/m ³ Mexico: STEL 15 ppm Mexico: STEL 75 mg/m ³
Chemical name	British Columbia	Quebec	Ontario TWAEV	Alberta
2-Methylnaphthalene 91-57-6	TWA: 0.5 ppm Skin		TWA: 0.5 ppm Skin	
1-Methylnaphthalene 90-12-0	TWA: 0.5 ppm Skin		TWA: 0.5 ppm Skin	
Naphthalene 91-20-3	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 52 mg/m ³ STEL: 15 ppm STEL: 79 mg/m ³	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 52 mg/m ³ STEL: 15 ppm STEL: 79 mg/m ³ Skin

Occupational exposure controls

Engineering measures	Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.
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Personal protective equipment

General information	If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.
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Respiratory Protection	For dust, splash, mist or spray exposures wear a filtering mask.
Eye/Face Protection	For dust, splash, mist or spray exposure, wear chemical protective goggles
Skin and Body Protection	Wear long-sleeved shirt, long pants, socks, and shoes.
Hand Protection	Protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion and the contact time.
Hygiene measures	Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Brown orange liquid
Color	Brown orange
Physical State	Liquid
Odor	Aromatic
pH	5.3 (1% solution)
Boiling Point/Range	Not applicable
Flash point	79.9 °C / 168.08 °F Closed cup
Density	9.0 lb/gal
Specific gravity	1.08 @ 20°C
Water solubility	No information available

10. STABILITY AND REACTIVITY

Stability	Stable under recommended storage conditions.
Conditions to Avoid	Heat, flames and sparks
Materials to avoid	Strong oxidizing agents
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO ₂), Hydrogen chloride, Hydrogen fluoride, Nitrogen oxides (NO _x), Sulfur oxides.
Hazardous polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Effects

Acute toxicity

Signs of toxicity in laboratory animals included mydriasis, cyanosis, ataxia, dyspnea, lacrimation, and diarrhea.

Eye Contact	Minimally irritating
Skin Contact	Slightly or non-irritating (rabbit)
LD50 Dermal	> 4000 mg/kg (rat)
LD50 Oral	4077 mg/kg (rat)

LC50 Inhalation > 6.31 mg/L 4 hr (rat)

Sensitization Non-sensitizing

Chronic Effects

Chronic toxicity Carfentrazone-ethyl: Long-term exposure caused hematotoxicity and deposit of porphyrin in the liver in animal studies.

Carcinogenicity Carfentrazone-ethyl : No evidence of carcinogenicity from animal studies. There was no evidence of carcinogenic activity of naphthalene in male mice, but there was some evidence of carcinogenic activity in female mice and clear evidence of carcinogenic activity in male and female rats in 2-year inhalation studies conducted by the National Toxicology Program (NTP).

Mutagenicity Carfentrazone-ethyl : Not genotoxic in laboratory studies.

Reproductive toxicity Carfentrazone-ethyl : No toxicity to reproduction in animal studies.

Neurological effects Carfentrazone-ethyl : Not neurotoxic.

Developmental toxicity Carfentrazone-ethyl : Not teratogenic in animal studies.

Chemical name	ACGIH	IARC	NTP	OSHA	NIOSH - Target Organs
Naphthalene	A3	Group 2B	Reasonably Anticipated	X	eyes,blood,liver,kidneys,skin,CNS

Legend:

ACGIH (American Conference of Governmental Industrial Hygienists)

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Carfentrazone-ethyl (128639-02-1)				
Active Ingredient(s)	Duration	Species	Value	Units
Carfentrazone-ethyl	72 h EC50	Algae	0.012	mg/L
	96 h LC50	Fish	1.6	mg/L
	48 h LC50	Daphnia	>9.8	mg/L
	96 h NOEC	Algae	1.0	µg/L
	21 d NOEC	Fish	0.0187	mg/L
	21 d NOEC	Crustacea	0.22	mg/L

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to Microorganisms	Toxicity to daphnia and other aquatic invertebrates

Naphtha (petroleum), heavy aromatic		96 h LC50: = 19 mg/L (Pimephales promelas) 96 h LC50: = 2.34 mg/L (Oncorhynchus mykiss) 96 h LC50: = 1740 mg/L (Lepomis macrochirus) 96 h LC50: = 45 mg/L (Pimephales promelas) 96 h LC50: = 41 mg/L (Pimephales promelas)		48 h EC50: 0.95 mg/L (Daphnia magna)
Naphthalene		96 h LC50: 5.74 - 6.44 mg/L (Pimephales promelas) 96 h LC50: = 1.6 mg/L (Oncorhynchus mykiss) 96 h LC50: 0.91 - 2.82 mg/L (Oncorhynchus mykiss) 96 h LC50: = 1.99 mg/L (Pimephales promelas) 96 h LC50: = 31.0265 mg/L (Lepomis macrochirus)		48 h LC50: 2.16 mg/L (Daphnia magna) 48 h EC50: 1.96 mg/L (Daphnia magna) 48 h EC50: 1.09 - 3.4 mg/L (Daphnia magna)

Environmental Fate

Chemical name	Partition coefficient
2-Methylnaphthalene	3.86
Naphthalene	3.3

Persistence and degradability Carfentrazone-ethyl : Non-persistent. Readily hydrolyzed. Not readily biodegradable.

Bioaccumulation Carfentrazone-ethyl : The substance does not have a potential for bioconcentration.

Mobility Carfentrazone-ethyl : Mobility in soil: Not relevant

13. DISPOSAL CONSIDERATIONS

Waste disposal methods Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

Contaminated Packaging Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions. Do not reuse or refill this container.

14. TRANSPORT INFORMATION

DOT This material is a Combustible liquid and is, therefore, not subject to the hazardous materials regulations when in non-bulk packages shipped within the USA per 49 CFR §173.150(f)(2).

Packaging Type	Bulk
Proper Shipping Name	Combustible liquid, n.o.s
UN/ID no	NA1993
Hazard class	3
Packing Group	III
Reportable Quantity (RQ)	Naphthalene
Additional Information	Naphthalene is a "RQ" quantity when this material meets or exceeds 100 pounds (45.4 kg) per package.

TDG Classification below is only applicable when shipped by vessel and is not applicable when shipped by road or rail only.

UN/ID no	UN3082
Hazard class	9
Packing Group	III
Marine Pollutant	Carfentrazone-ethyl

Description UN3082, Environmentally hazardous substance, liquid, n.o.s. (Carfentrazone-ethyl), 9, PG III, Marine Pollutant

ICAO/IATA

UN/ID no UN3082
Hazard class 9
Packing Group III
Marine Pollutant Carfentrazone-ethyl
Description UN3082, Environmentally hazardous substance, liquid, n.o.s. (Carfentrazone-ethyl), 9, PG III, Marine Pollutant

IMDG/IMO

UN/ID no UN3082
Hazard class 9
Packing Group III
EmS No. F-A, S-F
Marine Pollutant Carfentrazone-ethyl
Description UN3082, Environmentally hazardous substance, liquid, n.o.s. (Carfentrazone-ethyl), 9, PG III, Marine Pollutant

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	CAS-No	Weight %	SARA 313 - Threshold Values %
n-Butanol	71-36-3	1-5	1.0
Naphthalene	91-20-3	0.1-1	0.1

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic health hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Naphthalene	100 lb	

TSCA (United States)

Component	U.S. - TSCA (Toxic Substances Control Act) - Section 4 - Chemical Test Rules (40 CFR 799)	U.S. - TSCA (Toxic Substances Control Act) - Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs)
Naphthalene 91-20-3 (0.1-1)	40 CFR 799.5115	
Chemical name	U.S. - TSCA (Toxic Substances Control Act) - Section 8(a) - Chemical-Specific Reporting and Recordkeeping	
Naphthalene	PAIR: 08/04/1995	
Component	U.S. - TSCA (Toxic Substances Control Act) - Section 8(d) - 716.120(a) - Health and Safety Reporting - List of Substances	
Naphthalene 91-20-3 (0.1-1)	06/01/1987	

International Regulations

Mexico - Grade Moderate risk, Grade 2

Chemical name	Carcinogen Status	Mexico
Naphthalene		Mexico: TWA 10 ppm Mexico: TWA 50 mg/m ³ Mexico: STEL 15 ppm Mexico: STEL 75 mg/m ³

CANADA

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class

B3 - Combustible liquid
 D2A - Very toxic materials



16. OTHER INFORMATION

Revision date: 2015-03-06
 Reason for revision: (M)SDS sections updated.

Disclaimer

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Prepared By:

FMC Corporation

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End of Safety Data Sheet



NUFARM AGRICULTURE INC.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUPPLIED BY:

Nufarm Agriculture Inc.
5507 1st Street, SE
Calgary, AB. T2H 1H9
Phone Number: (403)-253-8471
Fax Number: (403)-253-8478

MANUFACTURED BY:

Nufarm Agriculture Inc.
5507 1st Street, SE
Calgary, AB T2H 1H9
Phone Number: (403)-253-8471
Fax Number: (403)-253-8478

PRODUCT:**Credit[®] Liquid Herbicide****PCP NUMBER:**

25866

DATE PREPARED:

January 6, 2015

PREPARER:

Nufarm Agriculture Inc.; Regulatory Affairs & Research Department

CHEMICAL FAMILY/USE:

Herbicide

FORMULA:C₆H₁₇N₂O₅P**CHEMICAL SYNONYMS:**

Glyphosate, isopropylamine salt; Glyphosate, IPA salt; N-(phosphonomethyl) glycine, isopropylamine salt

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	%	CAS NO.
Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt	40-42 w/w	38641-94-0 (as the salt) (1071-83-6 as the acid)
Surfactant	14-16 v/v	

Note: The other major ingredient in this product is water.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: CAUTION-IRRITANT. Keep out of reach of children. MAY CAUSE EYE IRRITATION HARMFUL IF SWALLOWED. Avoid contact with eyes or prolonged contact with skin.

EFFECTS OF ACUTE EXPOSURE:

INGESTION: This product is no more than slightly toxic based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.

SKIN CONTACT: This product is no more than slightly toxic and no more than slightly irritating based on toxicity studies. Prolonged contact may cause dermal irritation.

INHALATION: This product is no more than slightly toxic if inhaled based on toxicity studies.

EYE CONTACT: This product may cause eye irritation.

MEDICAL CONDITIONS AGGRAVATED: None Known.

TOXICOLOGICAL EFFECTS: See toxicological data in Section 11.

PRINCIPLE ROUTES OF EXPOSURE: Skin contact and inhalation.

TOXICOLOGICALLY SYNERGISTIC MATERIALS: None known.

OTHER: None known.



NUFARM AGRICULTURE INC.

4. FIRST AID MEASURES

If swallowed: Call a poison control centre 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 a poison control centre 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 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre 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 centre 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 centre or doctor for further treatment advice.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

Note to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLASH POINT:NAp

CONDITIONS OF FLAMMABILITY:May burn under fire conditions.

FLAMMABLE LIMITS IN AIR - Upper (%):NAp

FLAMMABLE LIMITS IN AIR - Lower (%):NAp

AUTOIGNITION TEMPERATURE:NAp

SENSITIVITY TO MECHANICAL IMPACT (Y/N): NA. No sensitivity expected based on long handling history.

SENSITIVITY TO STATIC DISCHARGE:NA. No sensitivity expected based on long handling history.

EXTINGUISHING MEDIA: Water fog, alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use. Minimize and contain water runoff.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Use safety equipment and procedures appropriate to the size of the spill. Keep unnecessary people away. Avoid runoff to natural waters and sewers. Surround and absorb spills with inert material such as perlite, sawdust, clay granules, vermiculite, sand or dirt. (Soak up small amounts of spill with absorbent clays.) Contain all affected material in a closed, labeled container for proper disposal. Isolate from other waste materials. Clean contaminated area such as hard surfaces with detergent and water, collecting cleaning solution for proper disposal. Large spills to soil or similar surfaces may necessitate removal of top soil.

See Section 13 for disposal information.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Handling:

KEEP OUT OF REACH OF CHILDREN. MAY CAUSE EYE IRRITATION. HARMFUL IF SWALLOWED. Avoid contact with eyes or prolonged contact with skin. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Avoid direct applications to any body of water. Do not contaminate water by disposal of waste or cleaning



NUFARM AGRICULTURE INC.

of equipment. Spray solutions of this product should be mixed, stored and applied only in stainless steel, aluminum, fiberglass, plastic and plastic lined steel containers. **DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS.** This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Storage:

Avoid contamination of seed, feed, and foodstuffs. Product is stable under normal conditions of storage and handling for at least 5 years. Store in a cool, well-ventilated place away from seed, feed, foodstuffs, reducing agents and acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

Hazardous Ingredients	TWA*	ACGIH TLV®	STEL	Units
Glyphosate IPA salt	N/E	N/E	N/E	N _{Ap}
Surfactant	N/E	N/E	N/E	N _{Ap}

*8-hour TWA unless otherwise noted

ENGINEERING CONTROLS: Undiluted product should be used in a well ventilated area. General ventilation with a good source of make-up air recommended as minimum for indoor situations.

RESPIRATORY PROTECTION EQUIPMENT: For Handling of the Undiluted Product: Undiluted product is not likely to present an airborne exposure concern during normal handling. If there is an accidental discharge of the material during manufacture or handling that produces a heavy vapor or mist, workers should use NIOSH/MSHA approved equipment. Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists or vapours is likely. In work situations where an air purifying respirator is appropriate to be used, use of a full face respirator equipped with purifying elements for protection against organic vapor and dust/mist approved for pesticides is recommended. Use cartridges or canister with NIOSH/MSHA approval. Full facepiece replaces the need for chemical goggles. Observe respirator use limitations specified by the manufacturers and NIOSH/MSHA.

For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use – dilutions of this product.

PROTECTIVE GLOVES: All types of impervious gloves for handling chemicals are acceptable, provided that they can be cleaned.

EYE AND FACE PROTECTION: Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted product is likely to occur.

OTHER PROTECTIVE EQUIPMENT: Use other equipment appropriate to specific situation.

VENTILATION: Use in well ventilated area. No special requirements apply to normal outdoor use.

SKIN PROTECTION: Wear appropriate protective clothing to prevent skin contact. Long sleeved shirt, long pants, socks and shoes suggested as minimum work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

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.

BOILING POINT:..... NA. Expected to be similar to water: >100°C.

VAPOR PRESSURE:..... Glyphosate negligible. Product expected to be similar to water.

VAPOR DENSITY (air = 1): NA.

FREEZING POINT: NA. Expected to be similar to water: 0°C.

MELTING POINT: NA. Glyphosate 200°C with decomposition.



NUFARM AGRICULTURE INC.

PHYSICAL STATE: Liquid.
ODOUR: Practically odorless to slight amine-like odor.
COLOUR: Clear amber.
ODOR THRESHOLD (ppm): NA
EVAPORATION RATE (butyl acetate = 1): NA
SPECIFIC GRAVITY (water = 1): 1.17 @ 25 degrees C
DENSITY @ 25°C: 1.17
pH: 4.4 to 4.9
SOLUBILITY IN WATER (20°C): Soluble.
COEFFICIENT OF WATER/OIL DISTRIBUTION: NA. Product water soluble.

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling. Store in a cool, well-ventilated place away from foodstuffs, reducing agents and acids.
HAZARDOUS POLYMERIZATION: Will not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.
HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS: None.
INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids and bases. See Section 7.
CONDITIONS TO AVOID: None known.

11. TOXICOLOGICAL INFORMATION

Data are from laboratory studies conducted on this product:
ACUTE ORAL LD₅₀ (mg/kg):..... > 5,000 (Rat)
ACUTE DERMAL LD₅₀ (mg/kg):.. > 5000 (Rabbit)
ACUTE INHALATION LC₅₀ (mg/l): > 3.18 mg/l (Rat 4-hr exp.)

OTHER:

Eye Irritation: Rabbits 24-hr exp.; Moderate to severe irritation.

Skin Irritation: Rabbits 4-hr exp.; Slightly irritating.

This product is not considered a dermal sensitizing agent in guinea pigs. At 5 times the intended use concentration of this product, 21-day dermal toxicity studies in rabbits resulted in severe dermal irritation and systemic toxicity (mortality, reduced feed consumption, body weight loss and testicular effects). When the test substance did not include surfactant and was at 3 or less times the intended use concentration, only slight to moderate local irritation was observed. Effects similar to those from the high concentration of this product were observed when the surfactant alone was tested. Effects in these studies are considered to be a secondary response to the stress of severe dermal irritation.

Components: Data from laboratory studies and from the scientific literature on components of this product:

ISOPROPYLAMINE SALT OF GLYPHOSATE:

Data from studies with formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight weight changes. Following repeated skin exposure (30 weeks) to MON 0139, skin irritation was the primary effect in rabbits.

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed at the high-dose level in one long-term (2 year) feeding study with rats, while no treatment-related effects



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occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. Based on the results from the chronic studies, USEPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

SURFACTANT:

The surfactant component of CREDIT Liquid Herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Data are from studies conducted on this product unless noted.

This product has been shown to be slightly to moderately toxic in aquatic studies:

96 HOUR LC₅₀ (mg/L):	22 (Rainbow Trout - static)
96 HOUR LC₅₀ (mg/L):	8.2 (Rainbow Trout - dynamic)
96 HOUR LC₅₀ (mg/L):	14 (Bluegill Sunfish - static)
96 HOUR LC₅₀ (mg/L):	5.8 (Bluegill Sunfish - dynamic)
96 HOUR LC₅₀ (mg/L):	9.4 (Fathead minnow)
96 HOUR LC₅₀ (mg/L):	16 (Channel Catfish)
96 HOUR LC₅₀ (mg/L):	20 (Chinook Salmon)
96 HOUR LC₅₀ (mg/L):	22 (Coho Salmon)
48 HOUR EC₅₀ (mg/L):	37 (Daphnia magna - aeration)
48 HOUR EC₅₀ (mg/L):	24 (Daphnia magna - without aeration)
48 HOUR EC₅₀ (mg/L):	42 (Gammarus pseudolimnaeus)

This product has been shown to be practically non-toxic to avian species following subacute dietary exposure.

DIETARY LC₅₀ (ppm):	> 6300 (Bobwhite Quail)
DIETARY LC₅₀ (ppm):	> 6300 (Mallard Duck)

CHEMICAL FATE INFORMATION: Glyphosate is rapidly and strongly adsorbed to soil. It has a soil half-life of approximately 47 days, but the adsorptive characteristic negates herbicidal activity almost immediately.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Disposal should be made in accordance with federal, provincial and local regulations. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.** Do not reuse this container for any purpose. If applicable, return container in accordance with return program. If a recyclable container, dispose of at a container collection site. Contact local distributor, dealer or municipality for the location of the nearest collection site.



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Before taking the container to the collection site, triple or pressure rinse the empty container adding rinsings to spray tank, and make container unsuitable for further use. If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

14. TRANSPORT INFORMATION

CANADIAN TDG DESCRIPTION (Road & Rail): None. Contact manufacturer for updates to transport information.

15. REGULATORY INFORMATION

WHMIS HAZARD CLASS: D2B Toxic Material

WHMIS TRADE SECRET: Exempt. (This product is regulated under the Pest Control Products Act - WHMIS exempt.)

CANADIAN INVENTORY: This product is currently exempt from CEPA.

HAZARD RATING SYSTEMS: HMIS: Not Available

NFPA: Not Available

16. OTHER INFORMATION

EMERGENCY TELEPHONE NUMBERS:

For spills or transportation accidents, Chemtrec, 1-800-424-9300.

For health or environmental emergencies, ProSAR, 1-877-325-1840.

For product and use information, Nufarm Agriculture Inc., 1-800-868-5444.

REVISIONS:

The following has been revised since the last issue of this MSDS: Section 1.

ADDITIONAL INFORMATION:

Abbreviations used throughout the MSDS are: NA = Not available

N/Ap = Not applicable

N/E = None Established.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Company references and data on substantially similar products utilized in preparation of the MSDS.

*****END OF MSDS*****