TIDE INTERNATIONAL USA, INC.
—A DIVISION OF TIDE GROUP

REVISION DATE: 22-MAR-2017 VERSION 1.0

[1. Identification]

Product name:	Tide Glufosinate 280 SL Herbicide
Chemical name:	Ammonium (3-amino-3-carboxypropyl)methyl phosphinate
Chemical family:	Organophosphorus
EPA Reg. No.:	84229-45
Recommended Use:	Systemic herbicide
Supplier:	Tide International USA, Inc. 21 Hubble, Irvine, CA 92618 (949) 679-3535 www.Tide-USA.com
For medical or chemical* emergencies: *Spill, leak, fire, exposure or accident	Call CHEMTREC®: 1-800-424-9300 (24 hours/day)
For non-emergency product information:	Call the NATIONAL PESTICIDE INFORMATION CENTER 1-800-858-7378 (Monday - Friday, 8-12 PM Pacific time)

[2. Hazard(s) Identification]

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR §1910.1200 (2012)

Classification of the substance or mixture: Mixture

Acute oral (Category 4) Acute dermal (Category 4)

Acute Inhalation (Category 4) Skin sensitization: Category 1

Eye irritation: Category 2A Reproductive toxicity (Category 1B)

Specific target organ toxicity-repeated exposure (Category 2)

GHS label elements:

GHS pictograms

Signal Word: DANGER

GHS Hazard statements

Harmful if swallowed.

Harmful if inhaled.

Causes serious eye irritation.

May cause an allergic skin reaction.

May damage fertility or the unborn child.

May cause damage to organs through prolonged or repeated exposure if swallowed

Precautionary statements:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Contaminated work clothing should not be allowed out of the workplace
Use only outdoors or in a well-ventilated area.
IF exposed or concerned: Get medical advice/attention.
Get medical advice/attention 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 eye irritation persists: Get medical advice/attention.
IF ON SKIN: Wash with plenty of water/ soap.
If skin irritation or rash occurs: Get medical advice/ attention.
Specific treatment (see supplemental first aid instructions on this label).
Wash contaminated clothing before reuse.
IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.
Rinse mouth.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Store locked up.
Dispose of contents/container in accordance with local regulation.
Routes of exposure: Eye contact, Inhalation, Skin Absorption, Ingestion
Carcinogenicity: Glufosinate-ammonium was not carcinogenic in lifetime feeding studies in rats and mice.
Other health concerns
NFPA Ratings: Health-2 Flammability-1 Reactivity-0
Environmental hazards:
Glufosinate-ammonium is highly soluble in water, non-volatile and has a low risk of leaching to groundwater. It is non-persistent in soils but may be persistent in aquatic systems. It is moderately toxic to mammals and considered to be a neurotoxin. It shows a moderate to low toxicity to birds, most aquatic organisms, earthworms and honeybees.

[3. Composition / Information on Ingredients]

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

Common name	CAS No.	Content (w/w,%)	ACIGH TWA
Glufosinate-ammonium	77182-82-2	24.5	NA
1-Methoxy-2-propanol	107-98-2	＜5.0	100 ppm
Alkyl polysaccharide	68515-73-1	＜16.0	NA
Alkylethersulfate, sodium salt	68891-38-3	＜20.0	NA
Other ingredient deemed not to be hazardous	Proprietary	Balance	NA

[4. First aid measures]

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact CHEMTREC® at 1-800-424-9300 for emergency medical treatment information.
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: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a POISON CENTER/doctor/physician if you feel unwell.

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 by a poison control center or doctor. Do not give anything to an unconscious person. Immediately call a POISON CENTER or doctor/physician if you fell unwell.
If inhaled: Remove person to fresh air and keep comfortable for breathing. If person is not breathing, call 911 for an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. If eye irritation persists: Get medical advice/ attention.
Most important symptoms/effects, acute and delayed:
Irritation, sensitizing effects
Note to Physician: If this product is ingested, endotracheal intubation and gastric lavage should be performed as soon as possible followed by charcoal and sodium sulfate administration.

[5. Fire-Fighting measures]

Flashpoint: Not detected till boiling at 101.6°C
Combustibility: No data applicable
OSHA Flammability Classification: None
Suitable extinguishing media: Carbon dioxide (CO2), Dry powder, Foam, Water spray
Unsuitable extinguishing media: High volume water jet
Special hazards arising from the chemical (hazardous combustion products): In the event of fire the following may be released: Hydrogen cyanide (hydrocyanic acid), Carbon monoxide (CO), Oxides of phosphorus, Nitrogen oxides (NOx)
Special protective equipment and precautions for fire-fighters: Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing
Advice for firefighters: Fight fire from upwind position. Keep out of smoke. Remove product from areas of fire, or otherwise cool containers with water in order to avoid pressure being built up due to heat. Whenever possible, contain fire-fighting water by diking area with sand or earth. Do not allow run-off from fire-fighting to enter drains or water courses.

[6. Accidental release measures]

Personal precautions, protective equipment and emergency procedures:
Precautions: Isolate hazard area. Keep unauthorized people away. Avoid contact with spilled product or contaminated surfaces.
Environmental precautions: Do not apply directly to water, or to areas where surface water is present. Do not apply to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters or rinsate.
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 nontarget 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.

[7. Handling and Storage]

KEEP OUT OF REACH OF CHILDREN!

Precautions for safe handling:

Safe handling advices:

Handle and open container in a manner as to prevent spillage. Use only in area provided with appropriate exhaust ventilation.

Keep away from heat and sources of ignition.

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:

Do not use or store near heat or open flame. Keep the container tightly closed and dry in a cool, well-ventilated place. Storage temperature should not exceed 125ºF. If storage temperature for bulk Tide Glufosinate 280 SL is below 32ºF, the material should not be pumped until its temperature exceeds 32ºF. Protect against direct sunlight.

[8. Exposure controls / Personal protection]

Control parameters:

Components.	CAS-No	Control parameters	Basis
Glufosinate-ammonium	77182-82-2	NE	NE
1-Methoxy-2-propanol	107-98-2	50 ppm (TWA)	ACGIH
1-Methoxy-2-propanol	107-98-2	100 ppm (STEL)	ACGIH
1-Methoxy-2-propanol	107-98-2	360 mg/m^3/100 ppm (REL)	NIOSH
1-Methoxy-2-propanol	107-98-2	540 mg/ m^3/150 ppm (STEL)	NIOSH
1-Methoxy-2-propanol	107-98-2	360 mg/ m^3/100 ppm (TWA)	OSHA Z1A
1-Methoxy-2-propanol	107-98-2	540 mg/ m^3/150 ppm (STEL)	OSHA Z1A
1-Methoxy-2-propanol	107-98-2	380 mg/ m^3/100 ppm (TWA)	TN OEL
1-Methoxy-2-propanol	107-98-2	540 mg/ m^3/150 ppm (STEL)	TN OEL
1-Methoxy-2-propanol	107-98-2	1000ppb (ST ESL)	TX SEL
1-Methoxy-2-propanol	107-98-2	3700ug/ m^3 (ST ESL)	TX SEL
1-Methoxy-2-propanol	107-98-2	370ug/ m^3 (AN ESL)	TX SEL
1-Methoxy-2-propanol	107-98-2	100ppb (AN ESL)	TX SEL
1-Methoxy-2-propanol	107-98-2	540 mg/ m^3/150 ppm (STEL)	US CA OEL
1-Methoxy-2-propanol	107-98-2	360 mg/ m^3/100 ppm (TWA PEL)	US CA OEL
Alkyl polysaccharide	68515-73-1	600ug/m3 (ST ESL)	TX ESL
Alkyl polysaccharide	68515-73-1	60ug/m3 (AN ESL)	TX ESL
Alkylethersulfate, sodium salt	68891-38-3	5ug/m^3 (AN ESL)	TX ESL
Alkylethersulfate, sodium salt	68891-38-3	50ug/m^3 (ST ESL)	TX ESL

Appropriate engineering controls:

Personal protective equipment:

Always follow the label instructions when handling this product. 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 gloves (barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride (PVC) or Viton)

Eye protection Protective eyewear (goggles, face shield or safety glasses)

Skin and body protection Wear long-sleeved shirt and long pants and shoes plus socks. Wear a chemical resistant apron when mixing/loading and cleaning equipment.

General protective measures: Discard clothing and other absorbent materials that 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 exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Eye wash facility and safety shower should be available.

[9. Physical and chemical properties]

Appearance (physical state, color etc.): Light brown homogeneous liquid

Odor: Odorless

Odor threshold: No data available

pH value: 5.0-8.0 (1 % w/v)

Melting point/freezing point: No data available

Initial boiling point and boiling range: 101.6°C

Flash point: Not detected till boiling at 101.6°C

Evaporation rate: No data available

Flammability (solid, gas): Not applicable

Upper/lower flammability or explosive limits: Not applicable

Vapor pressure: <0.1mPa(20℃) (Glufosinate-ammonium technical)

Vapor density: No data available

Density: *ca.* 1.16 g/mL 20.0°C

Solubility(ies): Soluble in water

Partition coefficient: n-octanol/water: Kow logP<0.1 (pH 7, 22℃) (Glufosinate-ammonium technical)

Auto-ignition temperature: No data available

Decomposition temperature: No data available

Viscosity: 0.24 Pa·s at 20°C; 0.10 Pa·s at 45°C

Note Physical data are typical values based on material test but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis or as a specification.

[10. Stability and reactivity]

Reactivity: Product will not undergo polymerization

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid (e.g. static discharge, shock or vibration)**:** Extremes of temperature and direct sunlight.

Incompatible materials: Strong oxidizing agents, acids or bases.

Hazardous decomposition products: Carbon oxides. Carbon monoxide. Oxides of sulfur.

[11. Toxicological information]

Acute toxicity data have been bridged from a very similar formulation containing a similar concentration of the active ingredient, glufosinate-ammonium. The non-acute information pertains to the technical-grade active ingredient.

Exposure routes: Eye contact, Inhalation, Skin Absorption, Ingestion

Acute toxicity:

Acute oral toxicity: Female rat: LD50: > 300 - < 2,000 mg/kg

Acute dermal toxicity: Rat: LD50 > 2000 mg/kg

Acute inhalation toxicity: Male/female combined rat: LC_{50} (4h) > 2.1 mg/l

Skin irritation: Rabbit: slight irritation

Eye irritation: Rabbit: Severe eye irritation.

Sensitization: Guinea pig: Sensitizing

Chronic Toxicity: Glufosinate-ammonium was well tolerated in the rat but less well tolerated in the dog in subchronic studies. Glufosinate-ammonium has demonstrated effects on the central nervous system at high dose levels in standard toxicity studies using laboratory animals.

Carcinogenicity: Glufosinate-ammonium was not carcinogenic in lifetime feeding studies in rats and mice

Reproduction: Implantation loss occurred at high dose levels in a rat multigeneration study with Glufosinate-ammonium. There were no effects on male fertility.

Developmental Toxicity: Tests in the rat and rabbit indicate that exposure to high dose levels of Glufosinate-ammonium may result in embryotoxicity.

Neurotoxicity: Glufosinate-ammonium was not a neurotoxicant in acute and subacute neurotoxicity screening studies in rats. In a developmental neurotoxicity study in rats, offspring exposed to glufosinate-ammonium showed increases in locomotor activities. These effects occurred at high doses and in conjunction with maternal toxicity.

Mutagenicity: Glufosinate-ammonium was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

[12. Ecological information]

Ecotoxicity (Based on Glufosinate-ammonium technical):

Avian toxicity:

LC_{50} (8 day dietary) for Japanese quail > 5000 mg/kg

Aquatic organism toxicity:

LC_{50} (96 h) for rainbow trout: 710 mg/L

LC_{50} (96 h) for carp, bluegill sunfish, golden OREF > 1000mg/L

EC_{50} (48 h) for Daphnia:560-1000 mg/L.

Other non-target organism toxicity:

LD_{50} for Scenedesmus subspicatus ≥ 1000 mg/L

LD_{50} for Scenedesmus capricornutum: 37 mg/L

LD_{50} for bees >100µg/bee

LD_{50} for earthworms >1000mg/kg soil

Persistence and degradability: Rapidly degraded in surface levels of soil and in water. In soil DT_{50} 3-10d (lab), 7-20d (field); DT_{50} in water is 2-30d.

Bioaccumulative potential: Glufosinate-ammonium: Bioconcentration factor (BCF) < 1; Does not bioaccumulate.

Mobility in the soil: Glufosinate-ammonium: Highly mobile in soils

Other adverse effects:

This pesticide is toxic to vascular plants.

Under some conditions, this product may have a potential to run off to surface water or adjacent land.

Environmental Precautions: Do not apply directly to water, or to areas where surface water is present. Do not apply to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters or rinsate.

[13. Disposal considerations]

Dispose of contents and container in accordance with local regulations. End users must dispose of any unused product as per the label recommendations.

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

Container Disposal: Follow advice on product label and/or leaflet. Triple rinse containers. Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or incineration, or if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

[14. Transport information]

49CFR

According to national and international transport regulations this material is not classified as dangerous goods/hazardous material.

D.O.T.

UN number:	N/A
Shipping Description:	Not Regulated by DOT
D.O.T. Hazard Class:	N/A
Packing group:	III
Marine pollutant (Yes/No):	No

IMDG/IMO

UN number:	N/A
UN proper shipping Name:	Not Regulated
Hazard Class:	N/A
Packing group:	III
Marine pollutant (Yes/No):	No

ICAO/IATA

UN number:	N/A
UN proper shipping Name:	Not Regulated
Hazard Class:	N/A
Packing group:	III
Environm. Hazardous Mark:	No

B/L Freight Classification: Compounds, Tree or Weed Killing, N.O.I., other than poison, having a density of 20 lbs. or greater per cubic foot (NMC Class 60).

[15. Regulatory information]

EPA Reg. No.: 84229-45
EPA Signal word: Warning
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 for workplace labels of non-pesticide chemicals. The following is the hazard information as required on the pesticide label:

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

WARNING Causes substantial but temporary eye injury. Harmful if absorbed through skin. Harmful if swallowed. Do not get in eyes, on skin, or on clothing. Wear protective eyewear (goggles, face shield, or safety glasses). Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present. Do apply to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters or rinsate. This pesticide is toxic to vascular plants and should be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

Under some conditions, this product may have a potential to run off to surface water or adjacent land. Where possible, use methods which reduce soil erosion, such as no till, limited till and contour plowing. These methods also reduce pesticide run-off. Use of vegetation filter strips along rivers, creeks, streams, wetlands, etc., or on the downhill side of fields where run-off could occur to minimize water run-off is recommended.

US Federal Regulations

TSCA list

Alkylethersulfate, sodium salt 68891-38-3

1-Methoxy-2-propanol 107-98-2

Alkyl polysaccharide 68515-73-1

SARA Title III - Section 302 - notification and information

None

SARA Title III - Section 313 - toxic chemical release reporting

None

SARA Title III - Section 311/312 - hazard identification

Acute (immediate) Health Hazardous

Chronic (delayed) Health Hazardous

This product contains none of the components listed as Extremely Hazardous substances.

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-Methoxy-2-propanol	107-98-2	CA, IL, MN, RI

Canadian Regulations

All ingredients are on the inventory of exempt from Canadian's DSL list.

Canadian Domestic Substance List

Sodium alkyl ether sulphate	68891-38-3
1-Methoxy-2-propanol	107-98-2
Alkyl polysaccharide	68515-73-1

Environmental

CERCLA

None

Clean Water Section 307 Priority Pollutants

None

Safe Drinking Water Act Maximum Contaminant Levels

None

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.

[16. Other information]

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. Tide International USA, Inc. assumes no responsibility for results obtained or for incidental or consequential damages arising from the use of these data.