1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: ProDeuce®
EPA Reg. No.: 228-509
Synonyms: Mixture of Glyphosate and Prodiamine
Product Type: Herbicide Mixture

Company Name: Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

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

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2. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance and Odor: Yellow colored liquid with a faint odor.
Warning Statements: CAUTION. Keep out of reach of children. Causes moderate eye irritation. Avoid contact with eyes or clothing.

Potential Health Effects:
Likely Routes of Exposure: Inhalation, eye and skin contact.
Eye Contact: Moderately irritating based on toxicity studies. May cause pain, redness and tearing.
Skin Contact: Slightly toxic and slightly irritating based on toxicity studies.
Ingestion: Slightly toxic based on toxicity studies.
Inhalation: Low inhalation toxicity.
Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:
Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent sites.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt	38641-94-0	40.15
Prodiamine	29091-21-2	7.51
Other Ingredients Including:		52.34
Ethoxylated Tallowamines	61791-26-2	

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. 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.
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.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable due to aqueous formulation
Autoignition Temperature: Not determined **Flammability Limits:** Not determined

Extinguishing Media: Use water, dry chemical, foam, or carbon dioxide.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA 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. This product reacts with galvanized steel or unlined steel (except stainless steel) to produce hydrogen gas that may form a highly combustible gas mixture which could flash or explode.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon, nitrogen, and phosphorous.

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 1 **Flammability:** 1 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

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:
Avoid contact with eyes or clothing. Wear protective eyewear. Wash thoroughly with soap and water after handling. Stay off treated areas until sprays have dried. Precautions should be taken to prevent tracking product after application onto desirable grasses.

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined 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:
STORE ABOVE 10° F (-12° C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68° F (20° C) for several days to redissolve and shake or roll to mix well before using. 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.

Personal Protective Equipment:
Eye/Face Protection: 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, socks and shoes. 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:

	OSHA		ACGIH		
Component	TWA	STEL	TWA	STEL	Unit
Isopropylamine Salt of Glyphosate	NE	NE	NE	NE	
Prodiamine	NE	NE	NE	NE	
Ethoxylated Tallowamines	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Yellow colored liquid with a faint odor.

Boiling Point:	Not determined	**Solubility in Water:**	Dispersible
Density:	9.96 pounds/gallon	**Specific Gravity:**	1.196 @ 20°C
Evaporation Rate:	Not determined	**Vapor Density:**	Not determined
Freezing Point:	Not determined	**Vapor Pressure:**	Not determined
pH:	4.5 – 5.5 (1% solution)	**Viscosity:**	408.082 cSt @ 20°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

Chemical Stability: This material is stable under normal handling and storage conditions.
Conditions to Avoid: Excessive heat. Do not store near heat or flame.
Incompatible Materials: Strong oxidizing agents: bases and acids. This product reacts with galvanized steel or unlined steel (except stainless steel) to produce hydrogen gas that may form a highly combustible gas mixture which could flash or explode.
Hazardous Decomposition Products: Under fire conditions may produce gases such as oxides of carbon, nitrogen, and phosphorous.
Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:
Data from laboratory studies on this product are summarized below:
Oral: Rat LD_{50}: >5,000 mg/kg (female)
Dermal: Rat LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.06 mg/l
Eye Irritation: Rabbit: Mildly irritating
Skin Irritation: Rabbit: Slightly irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to glyphosate may decrease body weight gains and effects to liver. Repeated overexposure to prodiamine may decrease body weight gains and affect the liver and thyroid. The surfactant component of this product is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this product. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.
Carcinogenicity / Chronic Health Effects: Prolonged overexposure to glyphosate may cause effects to the liver. Prolonged overexposure to prodiamine may affect liver and thyroid. There was no evidence of carcinogenicity in animal studies using glyphosate. EPA has given glyphosate a Group E classification (evidence of non-carcinogenicity in humans). In animal studies with prodiamine, benign thyroid tumors were seen in rats, but none were observed in mice.
Reproductive Toxicity: In laboratory animal studies with glyphosate and prodiamine, effects on reproduction have been seen only at doses that produced toxicity to the parent animals. For prodiamine these effects were seen at high doses.
Developmental Toxicity: In animal studies, glyphosate did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother. For prodiamine, fetal toxicity has been seen at high dose levels in rats, developmental and maternal toxicity observed at 1g/kg/day.
Genotoxicity: Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells. Animal tests with prodiamine did not demonstrate mutagenic effects.

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

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on Glyphosate technical:

96-hour LC_{50} Bluegill:	120 mg/l	Bobwhite Quail 8-day Dietary LC_{50}:	>4,500 ppm
96-hour LC_{50} Rainbow Trout:	86 mg/l	Mallard Duck 8-day Dietary LC_{50}:	>4,500 ppm
48-hour LC_{50} Daphnia:	780 mg/l		

Data on Prodiamine

96-hour LC_{50} Bluegill Sunfish:	0.55 ppm	Bobwhite Quail 8-day Dietary LC_{50}:	>10,000 ppm
96-hour LC_{50} Rainbow Trout:	0.83 ppm	Mallard Duck 8-day Dietary LC_{50}:	>10,000 ppm
48-hour LC_{50} Daphnia magna:	0.66 ppm	Bees LC_{50}/EC_{50}:	>100 μg/bee

Environmental Fate:

In the environment, salts of glyphosate rapidly dissociate to glyphosate, which adsorbs strongly to soil and is expected to be immobile in soil. Glyphosate is readily degraded by soil microbes to AMPA (aminomethyl phosphonic acid) that is further degraded to carbon dioxide. Glyphosate and AMPA are unlikely to enter ground water due to their strong adsorptive characteristics. Terrestrially-applied glyphosate has the potential to move into surface waters through soil erosion because it may be adsorbed to soil particles suspended in the runoff. Aquatic applications registered for certain formulations may also result in glyphosate entering surface waters. Complete degradation is slow, but dissipation in water is rapid because glyphosate is bound in sediments and has low biological availability to aquatic organisms. These characteristics suggest a low potential for bioconcentration in aquatic organisms and this has been verified by laboratory investigations of glyphosate bioconcentration in numerous marine and freshwater organisms with and without soil. The maximum whole body bioconcentration factors for fish were observed to be less than 1X. Bioconcentration factors for sediment dwelling mollusks and crayfish tended to be slightly higher, but were always less than 10X. In addition, any residues accumulated in organisms were rapidly eliminated.

Prodiamine does not bioaccumulate. Prodiamine is persistent in soil (immobile) and has an average half-life of approximately 120 days. Prodiamine is stable in water (sinks in water after 24 hours).

13. DISPOSAL CONSIDERATIONS

Container Disposal:

Commerical:

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. Do not burn unless allowed by State and local ordinance. 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 is 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. Do not burn unless allowed by State and local ordinance. 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 flip 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 beings 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. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat the rinsing procedure two more times.

Residential:
Nonrefillable container. Do not reuse or refill this container.
If empty: Place in trash or offer for recycling if available.
If partly filled: Call your local solid waste agent for disposal instructions. Never place unused product down any indoor (including toilet) or outdoor (including sewer) drain.

14. TRANSPORTATION INFORMATION

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

DOT
< 119 gallons per completed package:
Non Regulated

≥ 119 gallons per completed package:
UN 3082, Environmentally hazardous substance, liquid, n.o.s., (Prodiamine), 9, III, Marine pollutant

IMDG
UN 3082, Environmentally hazardous substance, liquid, n.o.s., (Prodiamine), 9, III, Marine pollutant

IATA
Non Regulated

15. REGULATORY INFORMATION

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):
Immediate, Delayed

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
None

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not listed

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS 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.

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