

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION****Product Name:** Solution<sup>®</sup> Water Soluble**EPA Reg. No.:** 228-260**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 Certain sections of this SDS are superseded by federal law governed by EPA for a registered pesticide.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	Category 1
Acute toxicity, oral	Category 4
Skin Sensitization	Category 1

**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. May cause an allergic skin reaction. 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 breathing vapors or spray. 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.

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.

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

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	94.0 – 99.8
Methyl tert-butyl ether	1634-04-4	<0.05%
Proprietary Process Related Impurities	Trade Secret	Trade Secret

**Synonyms:** 2,4-D DMA; 2,4-Dichlorophenoxyacetic acid, dimethylamine salt

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

**If on Skin or Clothing:** Take off contaminated clothing. Rinse skin with plenty of water for several minutes. Call a poison control center or doctor for treatment advice.

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

**Indication of immediate medical attention and special treatment needed, if necessary:** Get immediate medical attention for eye contact.

**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:** Avoid creation of dusty conditions. If dry, sweep or scoop up material and place into container for disposal. If wet, pump any free liquid into an appropriate closed container. If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

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

**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:** If dry, sweep or scoop up material and place into container for disposal. If wet, 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. Avoid breathing dust. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets

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inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Users should 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:

Always use original container to store pesticides in a secure warehouse or storage building. This product should be stored in a cool, dry location. Do not store near seeds, fertilizers, insecticides, or fungicides. Container should be opened in a well-ventilated area. All containers should be kept tightly sealed when not in use. Do not contaminate water, feed or foodstuff 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 face shield, goggles or safety glasses with front, brow and temple protection. An emergency eyewash should be readily accessible to the work area.

**Skin Protection:** To avoid contact with skin, wear long-sleeved shirt and long pants, shoes and socks, plus chemical-resistant gloves. For overhead exposure, wear chemical-resistant headgear. Wear a chemical-resistant apron when cleaning up spills or equipment, mixing or loading. An emergency shower should be readily accessible to the work area.

**Respiratory Protection:** Not normally required. If dusts 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 <sup>3</sup>

\*Based on adopted limit for 2,4-D

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Light brown colored granular solid
<b>Odor:</b>	Amine
<b>Odor threshold:</b>	No data available
<b>pH:</b>	6.5 (1% w/v solution in DIW)
<b>Melting point/freezing point:</b>	No data available
<b>Initial boiling point and boiling range</b>	No data available
<b>Flash point:</b>	No data available
<b>Evaporation rate:</b>	No data available
<b>Flammability (solid, gas):</b>	No data available
<b>Upper/lower flammability or explosive limits:</b>	No data available
<b>Vapor pressure:</b>	No data available
<b>Vapor density:</b>	No data available
<b>Relative density:</b>	0.72 g/mL (pour) 0.93 g/mL (tap)
<b>Solubility(ies):</b>	Soluble
<b>Partition coefficient: n-octanol/water:</b>	No data available
<b>Autoignition temperature:</b>	No data available
<b>Decomposition temperature:</b>	No data available
<b>Viscosity:</b>	Not applicable due to product form (solid)

**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:** 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 and oxides of nitrogen and carbon.

**11. TOXICOLOGICAL INFORMATION**

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

**Symptoms of Exposure:** Causes irreversible eye damage. Vapors and mist can cause eye irritation. May cause slight transient skin irritation. Overexposure by skin absorption may cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. Harmful if swallowed. Ingestion may cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. May be harmful if inhaled. May cause upper respiratory tract irritation and symptoms similar to those from ingestion.

**Toxicological Data:**

Data from laboratory studies on this product are summarized below:

**Oral:** Rat LD<sub>50</sub>: 550 mg/kg (female)

**Dermal:** Rabbit LD<sub>50</sub>: >2,000 mg/kg

**Inhalation:** Rat 4-hr LC<sub>50</sub>: No data available

**Eye Irritation:** Rabbit: Corrosive/severely irritating

**Skin Irritation:** Rabbit: Moderately irritating

**Skin Sensitization:** Guinea pig: 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.

**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. 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:

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Chlorophenoxy Herbicides	No	2B	No	No

**12. ECOLOGICAL INFORMATION**

**Environmental Hazards:**

This pesticide may be hazardous to fish and aquatic invertebrates. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

**Ecotoxicity:**

Data on 2,4-D Dimethylamine Salt:

96-hour LC<sub>50</sub> Bluegill:

524 mg/l

Bobwhite Quail Oral LD<sub>50</sub>:

500 mg/kg

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96-hour LC <sub>50</sub> Rainbow Trout:	250 mg/l	Mallard Duck 8-day Dietary LC <sub>50</sub> :	>5,620 ppm
48-hour EC <sub>50</sub> Daphnia:	184 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.

## 13. DISPOSAL CONSIDERATIONS

### Waste Disposal Method:

Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixtures, or rinsate is a violation of Federal law and may contaminate groundwater. If container is damaged or if pesticide has spilled, contain all spillage. Clean up all spilled material with broom. Place in a closed, labeled container for proper disposal. 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 container. Do not reuse or refill this container. Completely empty bag into application equipment, then offer for recycling if available, or dispose of empty bag in a sanitary landfill or by incineration. Do not burn unless allowed by state and local ordinance. If burned, stay out of smoke.

## 14. TRANSPORTATION INFORMATION

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

### DOT:

**<100 pounds per completed package**

Non Regulated

**≥ 100 pounds per completed package**

UN 3077, Environmentally hazardous substance, solid, n.o.s. (2,4-D Salt), 9, III, RQ

### IMDG:

UN 3077, Environmentally hazardous substance, solid, n.o.s. (2,4-D Salt), 9, III, RQ

### IATA:

UN 3077, Environmentally hazardous substance, solid, n.o.s. (2,4-D Salt), 9, III, RQ

## 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. Wear goggles, faceshield, or safety glasses. Harmful if swallowed, absorbed through the skin, or inhaled. Prolonged or frequently repeated skin contact cause allergic reactions in some individuals. Do not get in eyes, on skin, or on clothing. Avoid breathing dust. Wash thoroughly with soap and water after handling and before eating, drinking, and chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

### 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

### Section 313 Toxic Chemical(s):

None

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### 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 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.

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