



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont  
Material Safety Data Sheet

Page 1

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"DuPont" "LAYBY" PRO HERBICIDE  
M0000584 Revised 21-DEC-2007  
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CHEMICAL PRODUCT/COMPANY IDENTIFICATION  
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Material Identification

"DuPont", "LAYBY" are trademarks of DuPont.

Tradenames and Synonyms

LAYBY PRO  
B11932524

Company Identification

MANUFACTURER/DISTRIBUTOR  
DuPont  
1007 Market Street  
Wilmington, DE 19898

PHONE NUMBERS

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

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COMPOSITION/INFORMATION ON INGREDIENTS  
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Components

Material	CAS Number	%
*LINURON	330-55-2	20.3
3-(3,4-DICHLOROPHENYL)-1-METHOXY-1-METHYLUREA		
*DIURON	330-54-1	20
3-(3,4-DICHLOROPHENYL)-1,1-DIMETHYLUREA		
INERT INGREDIENTS (Including percentages of the following):		59.7
* Ethylene Glycol	107-21-1	

\* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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HAZARDS IDENTIFICATION  
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## Emergency Overview

Caution! Harmful if swallowed, inhaled, or absorbed through the skin. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with eyes, skin, or clothing.

## # Potential Health Effects

## BASED ON THE COMPONENTS

## Human Health Effects of Overexposure:

Significant skin permeation, and systemic toxicity, after contact appears unlikely. There are no reports of human sensitization.

Eye contact may initially include eye irritation with discomfort, tearing, or blurring of vision.

Based on data from animal testing, ingestion of large amounts may cause alterations in red blood cell counts and/or anemia, and spleen and liver effects.

No epidemiologic studies are available.

## ETHYLENE GLYCOL

The estimated lethal oral dose of Ethylene Glycol in humans is 100 mL.

Immediate effects of inhalation overexposure to Ethylene Glycol may include irritation of the nose and throat with sneezing, sore throat or runny nose. Gross overexposure may cause pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed.

Immediate effects of overexposure to Ethylene Glycol by inhalation or ingestion may include headache and nausea. Gross overexposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness; convulsions; altered kidney function which may be accompanied by abnormal urine volume, low back pain, discomfort or edema; kidney failure; deposits of calcium oxalate in the brain, spinal cord and kidneys; liver abnormalities; high blood pressure; irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Other effects may include congestive heart failure; retention of acid in the blood, making oxygen less available in the blood stream and leading to symptoms of increased pulse rate, nausea, vomiting, confusion and weakness which may progress to loss of consciousness; low blood sugar; low blood calcium with

## (HAZARDS IDENTIFICATION - Continued)

muscle twitching; involuntary movement of the eyes; facial paralysis; or fatality.

No increases in chromosomal changes were noted in the circulating blood of workers exposed to Ethylene Glycol. Increased susceptibility to the effects of Ethylene Glycol may be observed in persons with pre-existing disease of the kidneys.

## Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material	IARC	NTP	OSHA	ACGIH
DIURON				A4

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FIRST AID MEASURES  
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## First Aid

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 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.

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 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.

Have product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-441-3637 for emergency medical treatment information.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Not a fire or explosion hazard.

## Extinguishing Media

Dry Chemical, CO2, Water Spray, Foam.

## Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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ACCIDENTAL RELEASE MEASURES  
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## Safeguards (Personnel)

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

## Spill Clean Up

Dike Spill. Prevent material from entering sewers, waterways, or low areas. Cover spill with absorbent material such as sweeping compound or clay. Sweep up and place in suitable (fiberboard) containers for later disposal.

For minor spills, leaks, etc., follow all precautions indicated on the product label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire or other emergency, call 1-800-441-3637 day or night.

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HANDLING AND STORAGE  
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## Handling (Personnel)

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/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.

## (HANDLING AND STORAGE - Continued)

## Storage

Do not contaminate water, food or feed by storage or disposal.  
Store product in original container only.

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

## Personal Protective Equipment

Mixers and loaders supporting ground application equipment must wear:

- Coveralls over long-sleeved shirt and long pants.
- Chemical resistant footwear plus socks.
- Chemical resistant gloves made of any waterproof material such as polyethylene or polyvinylchloride.
- A NIOSH approved particulate filtering respirator equipped with any N, R, or P class filter media with NIOSH approval number prefix TC-84A. It is recommended that the respirator wearer be fit tested, and trained in use, maintenance, and limitations of the respirator.
- Chemical resistant apron.

Groundboom applicators must wear:

- Long-sleeved shirt and long pants.
- Shoes plus socks.
- Chemical resistant gloves made of any waterproof material such as polyethylene or polyvinylchloride.
- Chemical resistant apron when cleaning equipment or spills.

All other mixers, loaders, and handlers must wear:

- Long sleeved shirt and long pants.
- Shoes plus socks.
- Chemical resistant gloves made of any waterproof material such as polyethylene or polyvinylchloride.
- A NIOSH approved particulate filtering respirator equipped with any N, R, or P class filter media with NIOSH approval number prefix TC-84A. It is recommended that the respirator wearer be fit tested, and trained in use, maintenance, and limitations of the respirator.
- Chemical resistant apron when cleaning equipment or spills.

## (EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

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, use detergent and hot water. Keep and wash PPE separately from other laundry.

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.

## Exposure Guidelines

## Applicable Exposure Limits

## LINURON

PEL (OSHA) : None Established  
TLV (ACGIH) : None Established

## DIURON

PEL (OSHA) : None Established  
TLV (ACGIH) : 10 mg/m<sup>3</sup>, 8 Hr. TWA, A4  
AEL \* (DuPont) : 1 mg/m<sup>3</sup>, 8 & 12 Hr. TWA, total dust

## Ethylene Glycol

PEL (OSHA) : None Established  
TLV (ACGIH) : Ceiling: 39.4 ppm, 100 mg/m<sup>3</sup>, aerosol, A4  
AEL \* (DuPont) : 50 ppm, 8 & 12 Hr. TWA, vapor  
10 mg/m<sup>3</sup>, 8 & 12 Hr. TWA, particulate  
Aerosol

\* 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.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Form : Liquid  
Color: : Off-White  
Odor: : Odorless  
pH : 7.31 (1% in water)  
Density : 9.92 lbs/gal  
Viscosity : 917 cps @ 23.7 C  
Relative Density: 1.19 g/mL @ 19.9 C

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable at normal conditions.

## Incompatibility with Other Materials

None reasonably foreseeable.

## Decomposition

Thermal decomposition may release toxic and/or hazardous gases.

## Polymerization

Polymerization will not occur.

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TOXICOLOGICAL INFORMATION  
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## # Animal Data

## Data based on product components:

Oral LD50	:	1919 mg/kg (rats)
Dermal LD50	:	> 2000 mg/kg (rabbits)
Inhalation 4-hour LC50	:	> 1.7 mg/L (rats)

Based on data from components, this product is a moderate eye irritant, but is not a skin irritant or skin sensitizer in animals.

## LINURON TECHNICAL

Repeated ingestion at high exposure levels caused increased sulfhemoglobin, reduced weight gain, central nervous system depression, growth depression, increased liver/body weight ratio, anemia, and decreased red blood cell counts; increased white blood cell counts, decreased weights (absolute and relative) of liver, kidneys and adrenals in male mice, and increased weights (absolute and relative) of liver, lung and spleen in female mice. Long term dietary administration of high doses of Linuron result in increased methemoglobin and sulfhemoglobin levels, hematological changes including mild hemolytic and bone marrow effects, liver changes, and organ weight changes. Animals exposed to a high dose before birth and until maturity showed weight loss and testicular effects; a few animals also exhibited eye lesions.

Tests in mice and rats demonstrate limited evidence for carcinogenic activity. Animal testing indicates that this compound does not have developmental, or reproductive effects.

## (TOXICOLOGICAL INFORMATION - Continued)

Linuron does not produce genetic damage in animals or in bacterial or mammalian cell cultures.

## DIURON

Repeated ingestion of Diuron led to increased hemolysis (destruction) of red blood cells and hemolytic anemia after continued exposure to high doses. Secondary effects as a result of excessive red blood cell hemolysis included enlarged spleens, pigment deposits in the spleen, changes in the bone marrow and kidney. Decreased body weights were also related to repeated ingestion of high doses of Diuron.

In addition to the effects described above, long-term effects observed in rodents after repeated ingestion of high doses also included thickening of the urinary bladder and kidney epithelium and liver toxicity. In chronic feeding studies, an increase in urinary bladder and renal pelvic tumors was observed in high-dose rats. A borderline increase in mammary tumors was observed in high-dose female mice, which is considered equivocal.

The weight of evidence indicates that Diuron does not produce genetic damage in bacterial or mammalian cell cultures, or in animals. Diuron is not considered a developmental toxicant. There was no evidence of developmental toxicity in rabbits. In rats, developmental effects occurred at doses higher than those which produced maternal toxicity. Testing in rats demonstrated no reproductive toxicity.

## ETHYLENE GLYCOL

Repeated ingestion exposure to Ethylene Glycol caused histopathological changes of the kidneys and bone marrow; kidney effects with oxalate crystal deposition; altered hematology, and decreased body weight. Long-term exposure caused kidney effects with oxalate crystal deposition; histopathological changes of the kidneys, liver, blood vessels, testes, and sperm; and decreased body weight. No deaths occurred in animals exposed by inhalation to saturated vapors of Ethylene Glycol.

Repeated inhalation exposure caused histopathological changes of the liver and lungs; eye irritation; and clouding of the eye (corneal opacity).

In animal testing Ethylene Glycol has not caused carcinogenicity. Reproductive data on adult animals show interference with reproduction only at levels which produce other toxic effects in the adult animal. Tests have shown Ethylene Glycol to cause developmental toxicity in animals. Ethylene Glycol has not produced genetic damage in bacterial cultures. There are reports indicating that Ethylene Glycol does not produce genetic damage in some animal or mammalian cell culture tests; however, there are reports in the

## (TOXICOLOGICAL INFORMATION - Continued)

literature that suggest positive results.

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ECOLOGICAL INFORMATION  
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## # Ecotoxicological Information

## AQUATIC TOXICITY:

## LINURON

96 hour LC50 - Bluegill sunfish: 9.6 mg/L.  
96 hour LC50 - Rainbow trout: 3.3 mg/L.  
48 hour EC50 - Daphnia magna: 1.9 mg/L.  
72 hour, EC50, Freshwater algae: 0.028 mg/L.

## AVIAN TOXICITY:

## LINURON

Acute Oral LD50 - Bobwhite Quail: 940 mg/kg.  
Acute Dietary LC50 - Bobwhite Quail: 1838 ppm.  
Acute Dietary LC50 - Mallard Duck: 5224 ppm  
Oral LC50 - Mallard duck: 3083 ppm.

## AQUATIC TOXICITY:

## DIURON

96-Hour LC50 - Bluegill sunfish: 25 mg/L  
96-Hour LC50 - Rainbow trout: 14.7 mg/L  
48-Hour EC50 - Daphnia magna: 1.4 mg/L  
EC50 - Algae - 0.018 mg/L

## AVIAN TOXICITY:

## DIURON

LD50 - Bobwhite Quail: 1104 mg/kg

## AQUATIC TOXICITY:

## ETHYLENE GLYCOL

96 hour LC50 - Fathead minnows: 49,000 mg/L.  
48 hour EC50 - Daphnia magna: 46,300 mg/L  
  
96 hour EC50 - Algae: 10,940 mg/L

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DISPOSAL CONSIDERATIONS  
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## Waste Disposal

Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

## ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic invertebrates. For terrestrial uses, 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 weather conditions favor drift from areas treated. Do not

## (DISPOSAL CONSIDERATIONS - Continued)

contaminate water when cleaning of equipment or disposing of equipment washwater and rinsate.

Ground Water Advisory: Linuron is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination.

Refer to the product label for additional application instructions relating to environmental precautions.

## Container Disposal

Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Container Refilling and Disposal (For Containers up to 250 gal): Refer to the product label. This is a refillable container. If the container is to be refilled, do not rinse with any material or introduce any pesticide other than this product.

Container Disposal for Bulk Containers: Refer to the product label. The container must only be refilled with this pesticide product. DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE. Check for leaks after refilling and before transporting.

Do not transport if this container is damaged or leaking.

Disposal of this container must be in compliance with State and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on the product label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire or other emergency, call 1-800-441-3637 day or night.

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TRANSPORTATION INFORMATION  
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## Shipping Information

DOT

Proper Shipping Name : Not Regulated by DOT (\* See Note 1)

IMO/IMDG : Environmentally Hazardous Substance,  
Liquid, n.o.s., (Linuron)

Hazard Class : 9

## (TRANSPORTATION INFORMATION - Continued)

UN/NA Number : UN 3082  
Packaging Group : III  
Marine Pollutant : Yes (add Marine Pollutant after basic description)  
Reportable Quantity : 100 Pounds (Diuron)  
IATA/ICAO : Not Regulated by IATA/ICAO  
(\* See Note 2)

## Notes:

- (1) If shipped in a bulk package for domestic transport use IMO/IMDG shipping description. And, if 100 or more pounds Diuron in a single package add RQ, (Diuron).
- (2) If a single package contains 100 or more pounds Diuron add RQ, (Diuron) and use IMO/IMDG description without Marine pollutant notation.

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REGULATORY INFORMATION  
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## U.S. Federal Regulations

## TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes  
Chronic : Yes  
Fire : No  
Reactivity : No

In the United States this product is regulated by the US Environmental Protection Agency under the Federal Insecticide, Fungicide and Rodenticide Act. It is a violation of federal law to use this product in a manner inconsistent with its labeling.

EPA Reg. No. 352-660

## OSHA:

These products are considered hazardous under the OSHA Hazardous Communication Standard (29 CFR Section 1910.1200).

## TSCA:

All product components are on the TSCA Chemical Inventory.

## CERCLA:

Releases of this material (Diuron: RQ = 100 pounds; Ethylene glycol: RQ = 5000 pounds) to air, land, or water are reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to the state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304 and 40 CFR §302.

## RCRA:

## (REGULATORY INFORMATION - Continued)

When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR Section 261.33.

## State Regulations (U.S.)

## CALIFORNIA PROP 65

This material contains Diuron, a chemical known to the State of California to cause cancer in laboratory animals.

Linuron: Listed as a developmental toxin.

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OTHER INFORMATION  
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## NFPA, NPCA-HMIS

## HAZARDS CLASSIFICATION:

(0-minimal, 1-slight, 2-moderate, 3-serious, 4-severe)

HMIS: HEALTH-2 FIRE-1 REACTIVITY-0

NFPA: HEALTH-1 FIRE-1 REACTIVITY-0  
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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS: DuPont Crop Protection

Address : Wilmington, DE 19898

Telephone : 1-888-638-7668

# Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS