

DuPont  
Material Safety Data Sheet

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DuPont "KROVAR" I DF HERBICIDE  
GPA00081 Revised 3-MAR-2005 Printed 10-MAY-2005  
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CHEMICAL PRODUCT/COMPANY IDENTIFICATION  
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Material Identification

"KROVAR" is a registered trademark of DuPont.

Corporate MSDS Number : DU005711

Tradenames and Synonyms

M2574

DuPont is a trademark of Dupont

Company Identification

MANUFACTURER/DISTRIBUTOR

E.I. du Pont Canada Company  
P.O. Box 2200  
Streetsville  
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122  
Medical Emergency : 1-800-441-3637 (24 hours)

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COMPOSITION/INFORMATION ON INGREDIENTS  
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Components

Material	CAS Number	%
*BROMACIL (5-BROMO-3-SEC-BUTYL-6-METHYLURACIL)	314-40-9	40 %
*DIURON (3-(3,4-DICHLOROPHENYL)-1,1-DIMETHYLUREA)	330-54-1	40 %
INERT INGREDIENTS		20 %

\* 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 or if absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing.

Material Safety Data Sheet  
(HAZARDS IDENTIFICATION - Continued)

Potential Health Effects

Based on animal data, skin contact with Krovar I DF may cause skin irritation with discomfort or rash.

Based on animal data, eye contact with Krovar I DF may cause eye irritation with tearing, or blurring of vision.

Based on animal data, repeated or excessive exposures by ingestion may cause abnormal liver function; spleen effects; and red blood cell effects with headache, weakness, cyanosis (bluish discoloration of the skin) possibly progressing to dizziness, incoordination, shortness of breath, increased pulse rate and loss of consciousness.

Individuals with preexisting diseases of the liver or bone marrow may have increased susceptibility to the toxicity of excessive exposures.

Toxicology tests with these active ingredients in which tumors were observed utilized study designs that incorporated excessive exposures over the lifetime of laboratory animals. Levels of human exposure under normal use are many times lower than the no-effect levels in these animal studies.

Carcinogenicity Information

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

Material	IARC	NTP	OSHA	ACGIH
BROMACIL				A3
DIURON				A4

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FIRST AID MEASURES  
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First Aid

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 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

## Material Safety Data Sheet

## (FIRST AID MEASURES - Continued)

treatment advice.

IF INHALED: No specific intervention is indicated as the product is not likely to be hazardous by inhalation. Consult a physician if necessary.

Have the 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.

## Notes to Physicians

Absorption of this product may lead to the formation of methemoglobin which, in sufficient concentration, causes cyanosis. Thorough cleansing of the entire contaminated area including scalp and nails, is of utmost importance. Moderate cyanosis can be treated by supportive measures such as bed rest and oxygen inhalation. Severe cyanosis may require intravenous injection of methylene blue, one milligram per kilogram of body weight. Cyanocobalamin (Vitamin B12), one milligram intramuscularly, may speed recovery. Intravenous fluids and blood transfusions may be indicated in very severe exposure. Methylene blue is contraindicated if the patient has confirmed or suspected glucose-6-phosphate dehydrogenase deficiency. Ascorbic acid has been suggested in such cases.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Autoignition : 420 C (788 F)

May be ignited by heat or open flame.

Lower Explosive Limit : 0.135 g/L

Like most organic powders or crystals, under severe dusting conditions, this material may form explosive mixtures in air.

## Extinguishing Media

Water Spray, Foam, Dry Chemical, CO2.

## Fire Fighting Instructions

Wear self-contained breathing apparatus. Wear full protective equipment. Use water spray. Runoff from fire control may be a pollution hazard.

If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the contamination hazard.

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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

Shovel or sweep up. Never return to container for reuse. Scoop into bags or boxes with plastic or aluminum shovel.

## Accidental Release Measures

If spill area is on ground near valuable plants or trees, remove top 2 inches of soil after initial clean up.

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HANDLING AND STORAGE  
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## Handling (Personnel)

Avoid breathing vapors or mist. Avoid breathing dust. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Wash clothing after use. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should 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.

## # Storage

Do not contaminate water, food or feed in storage. Store product in original container only. Store in a cool, dry place.

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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.

## (EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

## # Personal Protective Equipment

Some materials that are chemical resistant to this product are listed below. If you want more options follow the instructions for Category A on the EPA chemical resistance category selection chart.

Applicators and other handlers must wear:

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

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Follow manufacturer instructions for cleaning and 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

## BROMACIL

PEL (OSHA)	: None Established
TLV (ACGIH)	: 10 mg/m <sup>3</sup> , 8 Hr. TWA, A3
AEL * (DuPont)	: 10 mg/m <sup>3</sup> , 8 & 12 Hr. TWA

## 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

\* 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.

## Material Safety Data Sheet

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Solubility in Water : Dispersible  
Odor : None  
Form : Solid  
Color : Brown

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STABILITY AND REACTIVITY  
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## Chemical Stability

Stable at normal temperatures and storage conditions.

## Incompatibility with Other Materials

None reasonably foreseeable.

## Polymerization

Polymerization will not occur.

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TOXICOLOGICAL INFORMATION  
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## Animal Data

## Krovar I DF

Oral LD50: 2300 mg/kg in rats (Slightly toxic)  
Dermal LD50: > 2000 mg/kg in rabbits  
(Slightly to moderately toxic)  
Inhalation 4 hour LC50: > 5.2 mg/L in rats  
(Low toxicity)

Krovar I DF is a slight skin irritant, and a moderate eye irritant, but is not a skin sensitizer in animals.

## BROMACIL

Rabbits exposed dermally to Bromacil demonstrated no clinical signs of toxicity, and no gross tissue changes were observed.

Single exposure to Bromacil by ingestion resulted in incoordination, salivation, vomiting, weakness, tearing and dilated pupils. Repeated exposure caused liver changes, increased liver, adrenal, and heart weights, decreased kidney and spleen weights, and thyroid changes. Long-term exposure caused reduced weight gain, slight thyroid effects, and liver effects.

Single exposure to Bromacil by inhalation resulted in rapid and deep respiration. Repeated exposure caused slightly increased platelet counts, lower serum cholesterol, and slightly increased liver weights. All remaining animals were normal after a 14-day recovery period.

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(TOXICOLOGICAL INFORMATION - Continued)

Dogs fed Bromacil for one year had decreased body weight gain in the high dose group. Rats fed Bromacil for two years had reduced body weight gain, increased incidence of thyroid cysts, and enlargement of thymus at the high dose, and a dose-related increase in thyroid tumors. Mice fed Bromacil for 18-months had liver lesions in all male groups and an increase in liver tumors in the high dose males.

Animal testing indicates Bromacil does not have reproductive effects. Bromacil is not considered to be a developmental toxicant. Any developmental effects occurred at maternally toxic doses. The weight of evidence suggests that Bromacil does not produce genetic damage in mammalian or bacterial cells cultures or animal studies.

#### DIURON

Effects in animals from short inhalation exposure to Diuron include lethargy, incoordination, and nonspecific effects such as weight loss and irritation.

Repeated ingestion exposures with Diuron caused enlarged spleen, increased liver and kidney weights, reduced growth rate, pallor, anemia, red blood cell destruction, cyanosis, increased liver enzyme activity, and nonspecific effects such as weight loss and irritation. In addition, long-term effects included bone marrow changes, thickening of the urinary bladder, pigment deposits in the spleen, and kidney effects.

In chronic feeding studies an increase in urinary bladder tumors in high-dose rats and an increase of mammary tumors in high-dose female mice were observed. The weight of the evidence indicates that Diuron does not produce genetic damage in bacterial or mammalian cell cultures or in animal tests. 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 producing maternal toxicity. Testing in rats demonstrate no reproductive toxicity.

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#### ECOLOGICAL INFORMATION

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##### Ecotoxicological Information

#### AQUATIC TOXICITY:

##### BROMACIL

Slightly toxic.

96 hour LC50 - Fathead minnows: 182 mg/L.

#### AQUATIC TOXICITY:

##### DIURON

Moderately toxic.

## (ECOLOGICAL INFORMATION - Continued)

96 hour LC50 - Fathead minnows: 14.2 mg/L.  
96 hour LC50 - Bluegill sunfish: 25 ppm.  
96 hour LC50 - Rainbow trout: 20 ppm.

## AVIAN TOXICITY:

LD50 - Mallard Duck: > 2000 mg/kg.

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DISPOSAL CONSIDERATIONS  
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## # Waste Disposal

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

## ENVIRONMENTAL HAZARDS

Do not apply directly to water, or areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

Bromacil is known to leach through soil and has been found in ground water as a result of normal field use. Users are advised not to apply in areas where soils are permeable, particularly where ground water is used for drinking water. Consult with the pesticide state lead agency for information regarding soil permeability and aquifer vulnerability in your area.

## Container Disposal

Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

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TRANSPORTATION INFORMATION  
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## Shipping Information

## IMO/IMDG

Proper Shipping Name: NOT REGULATED

## DOT

Shipping Information: NOT REGULATED \*

\* Regulated for transport within the United States only if 100 pounds Diuron (250 pounds or more formulated Krovar I in solution contains 100 pounds Diuron) or more per single package.

## (TRANSPORTATION INFORMATION - Continued)

Proper Shipping Name : Environmentally Hazardous  
Substance, Liquid N.O.S.  
(Diuron)  
Hazard Class : 9  
UN Number : 3082  
Packing Group : III  
Reportable Quantity : Yes (100 pounds)

## Shipping Information -- Canada

This material is Not Regulated.

Product may be regulated by TDG when intended for disposal.

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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  
Pressure : No

## ADDITIONAL REGULATORY INFORMATION

SARA/CERCLA Reportable Quantity  
Diuron (100 lb)

## Canadian Regulations

Regulated under the Pest Control Products Act--WHMIS Exempt

Registration No. 22964 Pest Control Products Act

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OTHER INFORMATION  
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## NFPA, NPCA-HMIS

NFPA Rating  
Health : 1  
Flammability : 1  
Reactivity : 0

NPCA-HMIS Rating  
Health : 1  
Flammability : 1  
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

(Continued)

Additional Information

This product is registered and controlled under EPA/FIFRA regulations.

EPA Reg. No. 352-505

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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 : E.I. du Pont Canada Company  
Address : BOX 2300 STREETSVILLE  
MISSISSAUGA, ONTARIO  
L5M 2J4  
Telephone : 1-800-667-3925

# Indicates updated section.

End of MSDS