

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**Product Name:** **DiBro 4 + 2**  
**EPA Reg. No.:** 228-386  
**Synonyms:** Mixture of Diuron and Bromacil  
**Product Type:** Herbicide

**Company Name:** Nufarm Americas Inc.  
 150 Harvester Drive, Suite 200  
 Burr Ridge, IL 60527

**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

**Date of Issue:** April 30, 2010 **Supersedes:** December 9, 2008  
**Sections Revised:** 8, 13 and 14

**2. HAZARDS IDENTIFICATION**

**Emergency Overview:**

**Appearance and Odor:** White/gray or red colored granules with little odor.

**Warning Statements:** Caution. Keep out of reach of children. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing.

**Potential Health Effects:**

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

**Eye Contact:** Mildly irritating based on toxicity studies. Dusts may cause irritation.

**Skin Contact:** Slightly toxic and slightly irritating based on toxicity studies.

**Ingestion:** Slightly toxic if ingested based on toxicity studies

**Inhalation:** Low inhalation toxicity. May irritate the respiratory tract.

**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 wildlife and aquatic organisms in adjacent aquatic sites.

See Section 12: ECOLOGICAL INFORMATION for more information.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

COMPONENT	CAS NO.	% BY WEIGHT
Diuron	330-54-1	4.0
Bromacil	314-40-9	2.0
Other Ingredients Including: Crystalline silica as quartz	14808-60-7	94.0



**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:** 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

**Autoignition Temperature:** Not applicable

**Flammability Limits:** Not applicable

**Extinguishing Media:** Use extinguishing media suitable for surrounding materials. Dry chemical, carbon dioxide, foam, water spray or fog.

**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.

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

**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 Clean-Up and Disposal:** 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. 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 skin, eyes, or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash

thoroughly and put on clean clothing. 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. Do not enter or allow others to enter the treated area until dusts have settled.

**Storage:**

Always store pesticides in a secured warehouse or storage building. Do not store near seeds, fertilizers, insecticides or fungicides. Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment.

**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:** Not normally required. 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 shoe and chemical-resistant gloves made of waterproof material. An emergency shower or water supply should be readily accessible to the work area.

**Respiratory Protection:** Not normally required, except for applicators using tractor drawn spreaders and for all loaders, wear a NIOSH-approved dust/mist filtering respirator with MSHA/NIOSH approved prefix TC-21C or any N, R, P or HE filter. In other situations if vapors, mists or 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	
Diuron	NE	NE	10	NE	mg/m <sup>3</sup>
Bromacil	NE	NE	10	NE	mg/m <sup>3</sup>
Crystalline silica as quartz	10 (R)	NE	0.025 (R)	NE	mg/m <sup>3</sup>

R = Respirable Fraction

NE = Not Established

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance and Odor:** White/gray or red colored granules with little odor.

**Boiling Point:** Not applicable  
**Density:** 70 – 90 pounds/cubic foot  
**Evaporation Rate:** Not applicable  
**Freezing Point:** Not applicable  
**pH:** Not determined

**Solubility in Water:** Insoluble  
**Specific Gravity:** Not applicable  
**Vapor Density:** Not applicable  
**Vapor Pressure:** Not applicable  
**Viscosity:** Not applicable

**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:** May be incompatible with amine products.  
**Hazardous Decomposition Products:** Under fire conditions may produce gases such as hydrogen chloride and oxides of carbon and nitrogen.  
**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<sub>50</sub>: >5,000 mg/kg (female)
- Dermal:** Rat LD<sub>50</sub>: >5,000 mg/kg
- Inhalation:** Rat 4-hr LC<sub>50</sub>: >2.03 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 diuron may cause reduced body weight gain, enlarged spleen, increased liver and kidney weights, and effects to blood, bladder and kidney. Repeated overexposure to bromacil may cause liver changes, increased liver, adrenal, and heart weights, and decreased kidney and spleen weights, changes in thyroid and blood chemistry.

**Carcinogenicity / Chronic Health Effects:** Chronic effects from diuron in blood, bladder and kidney. Chronic effects from bromacil may cause reduced weight gain, thyroid and liver effects. In animal studies with diuron, an increase in urinary bladder tumors in rats and an increase of mammary tumors in mice were observed. The U.S. EPA has classified bromacil as a Group C carcinogen (possible human carcinogen) based on increased incidences of liver tumors in male mice and positive trends in thyroid tumors in male rats. The carrier for this product is not listed as a carcinogen. However, it may contain crystalline silica (e.g. quartz), a naturally occurring component. Inhalation of crystalline silica may cause pulmonary fibrosis (silicosis). Crystalline silica has been classified by IARC as carcinogenic to humans (Group 1), by the U.S. National Toxicology Program as a known human carcinogen and by ACGIH as a suspected human carcinogen (A2).

**Reproductive Toxicity:** Neither diuron nor bromacil demonstrated reproductive effects in animal studies.

**Developmental Toxicity:** Diuron did not cause developmental effects in rabbits. In rat studies, effects were observed only at maternally toxic dose levels. Bromacil studies in laboratory animals show developmental effects only at exposure levels producing other toxic effects in the parental animal.

**Genotoxicity:** Studies indicate that neither diuron nor bromacil produce genetic damage in mammalian or bacterial cell cultures or in animal studies.

**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
Crystalline Silica, Quartz	A2	1	Known	No

See Section 2: HAZARDS IDENTIFICATION for more information.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity:**

Data on Diuron:

96-hour LC <sub>50</sub> Bluegill:	2.8 mg/l	Bobwhite Quail 8-day Dietary LC <sub>50</sub> :	1,730 ppm
96-hour LC <sub>50</sub> Rainbow Trout:	1.95 mg/l	Mallard Duck Oral LD <sub>50</sub> :	>2,000 mg/kg
96-hour LC <sub>50</sub> Fathead Minnow:	14.2 mg/l	Mallard Duck 8-day Dietary LC <sub>50</sub> :	>5,000 ppm
48-hour EC <sub>50</sub> Daphnia:	1.4 ppm		

Data on Bromacil:

96-hour LC <sub>50</sub> Bluegill:	127 ppm	Bobwhite Quail 8-day Dietary LC <sub>50</sub> :	>10,000 ppm
96-hour LC <sub>50</sub> Rainbow Trout:	36 ppm	Bobwhite Quail Oral LD <sub>50</sub> :	2,250 mg/kg
48-hour EC <sub>50</sub> Daphnia:	121 ppm		

**Environmental Fate:**

Diuron is mobile and very persistent in soils. Sorption of diuron to soil is highly correlated with soil organic matter. The average half-life in soils ranges from months to a year. The major route of dissipation for diuron in the environment is microbial degradation. Diuron also degrades through photolysis in both water and soil, but at a slower rate. Bromacil is highly mobile and persistent in soils. Bromacil binds only slightly to soil particles. Bromacil is stable to hydrolysis under normal environmental conditions. The primary routes of dissipation appear to be photolysis in water under alkaline conditions and microbial degradation in anaerobic soil. Soil half-lives range from 2 – 8 months.

**13. DISPOSAL CONSIDERATIONS**

**Waste Disposal Method:**

Open dumping is prohibited. Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility. Place in a closed, labeled container for proper disposal.

**Container Handling and Disposal:**

**For rigid container:** Nonrefillable container. Do not reuse or refill the container. Completely empty container by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then offer for recycling or recondition or puncture and dispose of in a sanitary landfill or by other procedures approve by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities by burning. If burned, stay out of smoke.

**For bag:** Nonrefillable container. Do not reuse or refill the container. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner and drum in a sanitary landfill or by incineration if allowed by State and local authorities. If burned, stay out of smoke.

**14. TRANSPORTATION INFORMATION**

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

**DOT**

Non Regulated

**IMDG**

Non-regulated

**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 and Delayed

**Section 313 Toxic Chemical(s):**

Diuron (CAS No. 330-54-1), 4.0% by weight in product  
Bromacil (CAS No. 314-04-9), 2.0% by weight in product

**Reportable Quantity (RQ) under U.S. CERCLA:**

Diuron - (CAS No. 330-54-1) 100 pounds

**RCRA Waste Code:**

None

**State Information:**

Other state regulations may apply. Check individual state requirements.

**California Proposition 65:** WARNING. This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

**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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