



Epic DF Herbicide

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name Epic DF Herbicide
Chemical Name
Synonym
MSDS Number R000032887
Chemical Family
Chemical Formulation
EPA Registration No. 264-800
Canadian Registrat. No.

Bayer CropScience
 2 T.W. Alexander Drive
 Research Triangle PK, NC 27709
 USA

For Product Use Information: (866)-992-2937 Monday through Friday(CRLF) 8:00AM-4:30PM(CRLF) For Medical Emergency contact DART: (800) 334-7577 24 Hours/Day(CRLF) For Transportation Emergency CHEMTREC: (800) 424-9300 24 Hours/Day

Product Use Description For weed control in field corn and corn grown for silage.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component Name</u>	<u>CAS No.</u>	<u>Concentration % by Weight</u>	
		<u>Minimum</u>	<u>Maximum</u>
Flufenacet	142459-58-3	46.5000	49.4000
ISOXAFLUTOLE	141112-29-0	9.5000	10.5000
Crystalline Silica (Quartz)	14808-60-7		0.8100

SECTION 3. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview Caution! Harmful if swallowed or inhaled. Avoid contact with skin, eyes and clothing. Avoid breathing dusts.

Appearance Light brown

Routes of Exposure Inhalation, skin contact, skin absorption, eye contact.

Immediate Effects
General

CARCINOGENICITY: This product is not listed as a carcinogen by NTP or IARC, or regulated as a carcinogen by OSHA. However, it may contain crystalline silica

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(quartz), a substance which is classified by NTP as a Group 2 carcinogen and by IARC as a Group I carcinogen. Crystalline silica is a naturally-occurring mineral component of many sands and clays. Although controversial, the carcinogenic potential of crystalline silica must be considered if it is inhaled under excessive exposure conditions. However, the respirable portion of the silica which may be contained in this product is small, such that excessive inhalation exposure during normal conditions of use is unlikely.

NTP: Crystalline silica is classified as an NTP Anticipated Human Carcinogen - "Substances or groups of substances that may reasonably be anticipated to be carcinogens."

IARC: IARC has classified crystalline silica as a Group I carcinogen. "There is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica (quartz) from occupational sources."

OSHA: Not regulated.

Eye	Mildly irritating.
Skin	Mildly toxic. Mildly irritating.
Ingestion	Harmful if swallowed. Mildly toxic.
Inhalation	Harmful if inhaled.
Medical Conditions Aggravated by Exposure	No specific medical conditions are known which may be aggravated by exposure to the active ingredient in this product. Pulmonary and respiratory diseases may be aggravated by exposure to respirable crystalline silica.

SECTION 4. FIRST AID MEASURES

Eye	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.
Skin	Wash with plenty of soap and water. Get medical attention if irritation develops and persists.
Ingestion	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 a poison control center or doctor. Do not give anything by mouth to an unconscious person.
Inhalation	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.
Note to Physician	No specific antidote is available. Treat the patient symptomatically.

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SECTION 5. FIRE FIGHTING MEASURES

Flash Point	Not applicable
Fire and Explosion Hazards	Dispersion of fine dust in the air can form an explosive mixture.
Suitable Extinguishing Media	Water, Carbon dioxide (CO ₂), Dry chemical, Foam
Fire Fighting Instructions	Keep out of smoke. Cool exposed containers with water spray. Fight fire from upwind position. Use self-contained breathing equipment. Contain runoff to prevent entry into sewers or waterways. Equipment or materials involved in pesticide fires may become contaminated.

SECTION 6. ACCIDENTAL RELEASE MEASURES

General and Disposal	Keep unnecessary people away, isolate hazard area and deny entry. Do not walk through spilled material.
Land Spill or Leaks	Avoid generating dust (a fine water spray mist, plastic film cover, or floor sweeping compound may be used if necessary). Avoid breathing dusts and skin contact. Use recommended protective equipment while carefully sweeping up spilled material. Place in covered container for reuse or disposal. Scrub contaminated area with soap and water. Rinse with water. Use dry absorbent material such as clay granules to absorb and collect wash solution for proper disposal. Contaminated soil may have to be removed and disposed. Do not allow material to enter streams, sewers, or other waterways.

SECTION 7. HANDLING AND STORAGE

Handling Procedures	Harmful if swallowed. Harmful if inhaled. Do not get in eyes, on skin, or on clothing. Do not breathe dust.
Storing Procedures	Do not contaminate water, food, or feed by storage or disposal. Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area.
Work/Hygienic Procedures	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.

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Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing.

As soon as practical, wash thoroughly and change into clean clothing.

Min/Max Storage Temperatures

Do not transport or store below -18 °C
Do not transport or store above 38 °C
30-day average not to exceed maximum temperature.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Maintain exposure levels below the exposure limit through the use of general and local exhaust ventilation.
Eye/Face Protection	Goggles should be used to prevent dust from getting into eyes.
Hand Protection	Chemical-resistant gloves made of waterproof material such as neoprene, butyl rubber, barrier laminate or nitrile rubber.
Body Protection	Long-sleeved shirt and long pants Shoes plus socks Chemical resistant apron when cleaning equipment, mixing or loading.
Respiratory Protection	When respiratory protection is necessary under the conditions of use, wear a respirator approved for pesticides by the National Institute for Occupational Safety and Health (NIOSH).
General Protection	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.

Exposure Limits

Crystalline Silica (Quartz)	14808-60-7	NIOSH	REL	0.05 mg/m3
		Form of Exposure	Respirable dust.	
		OSHA Z1A TWA		0.1 mg/m3
		Form of Exposure	Respirable dust.	
		US CA OEL TWA PEL		0.1 mg/m3
		Form of Exposure	Respirable dust.	
		US CA OEL TWA PEL		0.3 mg/m3
		Form of Exposure	Total dust.	
		ACGIH TWA		0.05 mg/m3

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Light brown
Physical State	Solid
pH	Granules 3.6 at (5% aqueous suspension at 25°C)
Bulk Density	32 lbs/ft ³

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	This is a stable material.
Hazardous Polymerization (Conditions to avoid)	Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity	Male Rat: LD50: 1,136 mg/kg Female Rat: LD50: 773 mg/kg
Acute Dermal Toxicity	Male/Female Combined Rat: LD50: > 5,000 mg/kg
Acute Inhalation Toxicity	Male/Female Combined Rat: LC50: 4-hr exposure to liquid aerosol: > 1.170 mg/l (analytical) Male/Female Combined Rat: 1-hr exposure to liquid aerosol (extrapolated from 4-hr LC50): > 4.680 mg/l (analytical)
Skin Irritation	Rabbit: Slight dermal irritant.
Eye Irritation	Rabbit: Mild irritation to the conjunctiva was observed with all irritation cleared within 72 hours post-treatment.
Sensitization	Guinea pig: Not a dermal sensitizer.

Only an eye irritation study has been conducted on this product as formulated. The other acute toxicity studies were performed on a similar formulation containing a higher percentage of the active ingredients (75%). The non-acute information pertains to the active ingredients, flufenacet and isoxaflutole technical.

Sub-Chronic Toxicity	In 3 month feeding studies in mice, rats, and dogs, the main target organs affected by exposure to flufenacet were brain, thyroid, liver, kidney, and spleen as indicted by changes in clinical chemistries, organ weights and/or
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histopathological findings. Alterations in circulating serum thyroid hormones (thyroxine and triiodothyronine) were observed in each species and were considered indicative of hepatic interference. Primary hematological parameters affected by treatment in each species included changes in erythrocytes, platelets, hemoglobin, and hematocrit concentrations. Histopathological findings generally correlated with alterations in organ weights. A decrease in body weight gain was observed in mice and rats. In a subacute dermal toxicity study, rats were treated with flufenacet at doses of 20, 150, or 1000 mg/kg. Animals were treated for 6 hours/day such that males received 17 applications and females received 18 applications in a period of 21- and 22 days, respectively. An additional control and high-dose group were treated and maintained for a period of two weeks so as to ascertain the extent of recovery. Effects observed included decreased levels for thyroxine (T4) and free thyroxine (FT4), increased liver weights, and centrilobular hepatocytomegaly. The additional animals treated with 1000 mg/kg demonstrated a complete recovery. The no-observed-effect-level (NOEL) was 20 mg/kg.

Chronic Toxicity

Dogs were administered flufenacet at dietary concentrations of 40, 800 or 1600 ppm for 1 year. Effects observed included decreased terminal body weights, head tilt, computerized electrocardiography findings, quantitative electroencephalography findings, clinical neurological findings, organ weight differences, and changes in clinical chemistry and hematology parameters. Micropathological observations were noted in the liver, kidney, eye, brain, spinal cord and sciatic nerve. The NOEL was 40 ppm. In a 2 year feeding study, rats were administered flufenacet at dietary concentrations of 25, 400 or 800 ppm. The toxicological response of the rat could be broadly characterized as involving structural and/or functional alterations in liver-, kidney-, hematologic/spleen-, and thyroid-related endpoints. Eye effects were also observed and included cataracts and ocular scleral mineralization. The NOEL was 25 ppm.

Assessment Carcinogenicity

Flufenacet was investigated for carcinogenicity in chronic feeding studies using mice and rats at maximum levels of 400 and 800 ppm, respectively. There was no evidence of a carcinogenic potential observed in either species. Isoxaflutole has been classified by the US EPA as "Likely Human Carcinogen" based on statistically significant increases in liver tumors in both sexes of mice and rats and a statistically significant increase in thyroid tumors in male rats. Isoxaflutole was found to increase incidence of liver tumors in rats and mice and thyroid tumors in male rats only at the highest doses tested in each species (500 mg/kg/day in rats and 1070 mg/kg/day in mice). The liver tumors are most likely related to the microsomal enzyme induction potential of isoxaflutole. The thyroid tumors in male rats are secondary to the liver induction by isoxaflutole which resulted in an increased clearance of T4 causing an imbalance in thyroid hormones.

ACGIH

Crystalline Silica (Quartz)

14808-60-7

Group A2

NTP

Crystalline Silica (Quartz)

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IARC

OSHA

None

Reproductive &

REPRODUCTION: In a reproduction study using rats, flufenacet was

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Developmental Toxicity administered at dietary concentrations of 25, 100, or 500 ppm for 2 generations. There were no compound-related effects on the adult reproductive or pup parameters. The NOELs for parental and reproductive toxicity were 25 and 500 ppm, respectively. Isoxaflutole is not a reproductive toxin.

DEVELOPMENTAL TOXICITY: In a developmental toxicity study, rats were administered flufenacet by oral gavage during gestation at doses of 5, 25, or 125 mg/kg. The NOEL for both maternal and developmental toxicity was 25 mg/kg. In a developmental toxicity study using rabbits, flufenacet was administered by oral gavage during gestation at doses of 5, 25, 125, or 200 mg/kg. The NOELs for maternal and developmental toxicity were 5 and 25 mg/kg, respectively. Isoxaflutole is not teratogenic.

Neurotoxicity In an acute neurotoxicity study using rats, flufenacet was administered as a single oral dose at doses of 75, 200, or 450 mg/kg for males and 75, 150, or 300 mg/kg for females. Compound-related deaths occurred at the high-dose for both sexes with all high-dose females dying within three days following treatment. All clinical signs and neurobehavioral effects observed were ascribed to acute systemic toxicity. Based on these results, the NOEL for neurotoxicity was 450 mg/kg for males and 150 mg/kg for females (the highest doses with survivors). The overall NOEL was 75 mg/kg for males and less than 75 mg/kg for females. In a subsequent study, an overall NOEL of 50 mg/kg was established for females. In a 13 week neurotoxicity study, flufenacet was administered to rats at dietary concentrations of 120, 600, or 3000 ppm. Effects observed at the high-dose included reduced body weights, reduced forelimb grip strength, slightly uncoordinated righting response, decreased body temperature, increased hindlimb footsplay, increased activity, and increased relative brain weight. Microscopic examinations revealed an increased incidence of axonal swelling in the brain and spinal cord tissues at the mid- and high-dose levels. The NOEL for subchronic neurotoxicity was 120 ppm based on microscopic lesions.

Mutagenicity In vivo and in vitro mutagenicity studies conducted on flufenacet have all been negative. Thus, flufenacet is not mutagenic. Isoxaflutole is not genotoxic.

SECTION 12. ECOLOGICAL INFORMATION

Environmental Precautions Drift or runoff may adversely affect non-target plants. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. 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 when weather conditions favor drift from treated areas. Do not contaminate water by cleaning of equipment or disposal of equipment wastewaters.

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SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance	Pesticide Disposal: Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility.
Container Disposal	Triple rinse (or equivalent). 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. If burned, stay out of smoke.
RCRA Classification	Not Regulated under this Statute

SECTION 14. TRANSPORT INFORMATION

TRANSPORTATION CLASSIFICATION:
Not regulated for transportation

FREIGHT CLASSIFICATION:
Compounds, Tree or Weedkilling, N.O.I., other than poison, having a density of 20 LBS or greater per cubic foot

SECTION 15. REGULATORY INFORMATION

US Federal Regulations

EPA Registration No.	264-800
TSCA list	
Crystalline Silica (Quartz)	14808-60-7
TSCA 12b export notification	
None	
SARA Title III - section 302 - notification and information	
None	
SARA Title III - section 313 - toxic chemical release reporting	
None	

US States Regulatory Reporting

CA Prop65

This product contains a chemical known to the state of California to cause cancer.	ISOXAFLUTOLE	141112-29-0
This product contains a chemical known to the state of California to cause cancer.	Crystalline Silica (Quartz)	14808-60-7

US State right-to-know ingredients

Crystalline Silica (Quartz)	14808-60-7	IL, MA, MN, PA
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Canadian Regulations

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Canadian Registrat. No.
Canadian Domestic Substance List
Crystalline Silica (Quartz)

14808-60-7

Environmental

CERCLA

None

Clean Water Section 307 Priority Pollutants

None

Safe Drinking Water Act Maximum Contaminant Levels

None

International Regulations

EU Classification

Flufenacet

142459-58-3

Harmful Dangerous for the environment

R Phrases

Harmful if swallowed. May cause sensitization by skin contact. Harmful: danger of serious damage to health by prolonged exposure if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S Phrases

Keep out of the reach of children. Keep away from food, drink and animal feedingstuffs. Avoid contact with the skin. Wear suitable gloves. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

ISOXAFLUTOLE

141112-29-0

Harmful Dangerous for the environment

R Phrases

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of harm to the unborn child.

S Phrases

Keep out of the reach of children. Wear suitable protective clothing and gloves. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

European Inventory of Existing Commercial Substances (EINECS)

Crystalline Silica (Quartz)

14808-60-7

SECTION 16. OTHER INFORMATION

NFPA	Health	Flammability	Reactivity	Others
	1	2	1	

MSDS REVISION INDICATOR: New Format.

Print Date: 09/18/2003

Supersedes MSDS, which is older than: 09/17/2003

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