



Safety Data Sheet

Fierce™ Herbicide

1. IDENTIFICATION: CHEMICAL PRODUCT AND COMPANY

PRODUCT NAME: Fierce™ Herbicide
EPA REGISTRATION NUMBER: 59639-193
VC NUMBER(S): 1868
PRODUCT DESCRIPTION: Herbicide

MANUFACTURER/DISTRIBUTOR
VALENT U.S.A. CORPORATION
P.O. Box 8025
1600 Riviera Avenue, Suite 200
Walnut Creek, CA 94596-8025

EMERGENCY TELEPHONE NUMBERS
HEALTH EMERGENCY OR SPILL (24 hr):
(800) 892-0099
TRANSPORTATION (24 hr.): CHEMTREC
(800) 424-9300 or (202) 483-7616

PRODUCT INFORMATION
AGRICULTURAL PRODUCTS: (800) 682-5368

2. HAZARDS IDENTIFICATION

For EPA FIFRA-specific information see Section 15

Classification

Reproductive toxicity

Category 2

Label elements

EMERGENCY OVERVIEW

WARNING



Hazard statements

Suspected of damaging fertility or the unborn child

Emergency Telephone: (800) 892-0099
REVISION NUMBER: 1

SDS NO.: 0438
REVISION DATE: 05/15/2015

Precautionary Statements - Prevention

Read product label prior to using this product. For specific handling instruction refer to Section 7, Handling and Storage

Precautionary Statements - Response

See Section 4, First Aid Measures

Precautionary Statements - Storage

For information on Storage and Handling see Section 7.

Precautionary Statements - Disposal

For further information on product and container disposal see Section 13.

Hazards not otherwise classified (HNOC)**Other Information**

25% of the mixture consists of ingredient(s) of unknown toxicity

For information on Transportation requirements see Section 14.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	Weight/ Percent	TRADE SECRET
Flumioxazin	103361-09-7	32 - 35	
Pyroxasulfone	447399-55-5	41 - 44	
Hydrated Amorphous Silica	112926-00-8	0.45 - 0.55	
Other ingredients	Various CAS#s	21 - 26	

* The chemical name, CAS number and/or exact percentage have been withheld as a trade secret

Other ingredients, which may be maintained as trade secrets, are any substances other than an active ingredient contained in this product. Some of these may be hazardous, but their identities are withheld because they are considered trade secrets. The hazards associated with the other ingredients are addressed in this document. Specific information on other ingredients for the management of exposures, spills, or safety assessments can be obtained by a treating physician or nurse by calling **(800) 892-0099** at any time.

4. FIRST AID MEASURES

EMERGENCY NUMBER (800) 892-0099

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact **1-800-892-0099** for emergency medical treatment information.

EYE CONTACT:

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 CONTACT:

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.

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 the 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 by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

NOTES TO PHYSICIAN:

None

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam, or water.

NFPA RATING:

Health:	1
Flammability:	1
Reactivity:	0
Special:	None

(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using professional judgement. Values were not available in the guidelines or published evaluations prepared by the National Fire Protection Association, NFPA.

FIRE FIGHTING INSTRUCTIONS: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) and full protective gear. Prevent extinguishing media run off from entering drains, sewers, and bodies of water.

HAZARDOUS DECOMPOSITION PRODUCTS: Not determined

6. ACCIDENTAL RELEASE MEASURES

VALENT EMERGENCY PHONE NUMBER: (800) 892-0099
CHEMTREC EMERGENCY PHONE NUMBER: (800) 424-9300
OBSERVE PRECAUTIONS IN SECTION 8: PERSONAL PROTECTION

Stop the source of the spill if safe to do so. Contain the spill to prevent further contamination of the soil, surface water, or ground water. For additional spill response information refer to the North American Emergency Response Guidebook.

UN/NA NUMBER: Not applicable **EMERGENCY RESPONSE GUIDEBOOK NO.:** Not applicable

FOR SPILLS OR LEAKS:

CONTAINMENT: Reduce airborne dust. Avoid runoff into storm sewers or other bodies of water. Keep well ventilated. Wear proper personal protective equipment.

CLEANUP: Clean up spill immediately. Vacuum or sweep up material and place in a chemical waste container. Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container. Prevent wash water from entering surface water or drains. Wear proper personal protective equipment.

7. HANDLING AND STORAGE

Emergency Telephone: (800) 892-0099
REVISION NUMBER: 1

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END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.**HANDLING:**

Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

STORAGE:

Keep in original container. Store in cool, dry, secure place. Do not put formulation or dilute spray solution into food or drink containers. Do not contaminate water, food or feed by storage or disposal. Do not store or transport near food or feed. Not for use or storage in or around the home.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.**INFORMATION FOR END USERS**

EYES & FACE: Do not get this material in your eyes. Eye contact can be avoided by wearing protective eyewear.

RESPIRATORY PROTECTION: Not usually required. Use this material in a well ventilated area. If necessary, use a NIOSH approved air purifying respirator with a dust-mist filter / organic vapor cartridge combination.

SKIN & HAND PROTECTION: Applicators and other handlers must wear: long-sleeved shirt and long pants, shoes plus socks and chemical-resistant gloves made of any waterproof material.

Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Remove clothing 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.

EXPOSURE LIMITS

Chemical Name	ACGIH Exposure Limits	OSHA Exposure Limits	Manufacturer's Exposure Limits
Flumioxazin	None	None	None
Pyroxasulfone	None	None	None
Hydrated Amorphous Silica	10 mg/m ³ (total amorphous dust); 3 mg/m ³ (respirable nuisance particulate)	6 mg/m ³ (total dust)	None
Other ingredients	None	None	None

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Free-flowing granules	Odor	Musty
Appearance	Granules	Odor threshold	No information available
Color	Brown		

PROPERTIES

pH

Values
6.72

Remarks • Method
@ 22° C

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Melting point/freezing point	No information available
Boiling point/boiling range	No information available
Flash point	
Evaporation rate	No information available
Flammability (solid, gas)	No information available
Flammability Limits in Air	
Upper flammability limits	No information available
Lower flammability limit	No information available
Vapor pressure	No information available
Vapor density	No information available
Specific Gravity	No information available
Water solubility	Dispersible in water
Solubility in other solvents	No information available
Partition coefficient	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity	Not Applicable
Explosive properties	Active ingredient not expected to be explosive based upon structure and formulated products contains no explosive ingredients
Oxidizing properties	Product ingredients do not include oxidizing or reducing agents
Density	No information available
Bulk density	42.37 lb/ft ³

10. STABILITY AND REACTIVITY

Reactivity

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

Extremes of temperature and direct sunlight.

Incompatible materials

None known based on information supplied.

Hazardous Decomposition Products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

The following information is for a similar product.

Oral Toxicity LD ₅₀ (rats)	> 5,000 mg/kg (female)	EPA Tox Category	IV
Dermal Toxicity LD ₅₀ (rats)	> 5,000 mg/kg	EPA Tox Category	IV
Inhalation Toxicity LC ₅₀ (rats)	> 2.04 mg/L	EPA Tox Category	IV
Eye Irritation (rabbits)	Moderately irritating	EPA Tox Category	III

Skin Irritation (rabbits)	Slightly irritating	EPA Tox Category	III
Skin Sensitization (guinea pigs)	Not a contact sensitizer.	EPA Tox Category	Not applicable

CARCINOGEN CLASSIFICATION

Chemical Name	IARC	OSHA - Select Carcinogens	NTP Carcinogen List
Flumioxazin	Not listed	Not listed	Not listed
Pyroxasulfone	Not listed	Not listed	Not listed
Hydrated Amorphous Silica	Group 3	Not listed	Not listed
Other ingredients	Not listed	Not Listed	Not listed

TOXICITY OF FLUMIOXAZIN TECHNICAL:

SUBCHRONIC: Compound related effects of Flumioxazin Technical noted in rats following subchronic exposures at high dose levels were hematotoxicity including anemia, and increases in liver, spleen, heart, kidney and thyroid weights. In dogs, the effects produced at high dose levels included a slight prolongation in activated partial thromboplastin time, increased cholesterol and phospholipid, elevated alkaline phosphatase, increased liver weights and histological changes in the liver. The lowest no-observable-effect-level (NOEL) in subchronic studies was 30 ppm in the three-month toxicity study in rats.

CHRONIC/CARCINOGENICITY: In a one year dog feeding study, Flumioxazin Technical produced treatment-related changes in blood chemistry and increased liver weights at 100 and 1000 mg/kg/day. Minimal treatment-related histological changes were noted in the livers of animals in the 1000 mg/kg/day group. Based on these data the NOEL is 10 mg/kg/day. Dietary administration of Flumioxazin Technical for 18 months produced liver changes in mice of the 3000 and 7000 ppm groups. There was no evidence of any treatment-related oncogenic effect. The NOEL for this study is 300 ppm. Dietary administration of Flumioxazin Technical for 24 months produced anemia and chronic nephropathy in rats of the 500 and 1000 ppm groups. The anemia lasted throughout the treatment period, however, it was not progressive nor aplastic in nature. No evidence of an oncogenic effect was observed. The NOEL for this study is 50 ppm.

DEVELOPMENTAL TOXICITY: Flumioxazin Technical produces developmental toxicity in rats in the absence of maternal toxicity at doses of 30 mg/kg/day by the oral route and 300 mg/kg/day by the dermal route. The developmental effects noted consisted primarily of decreased number of live fetuses and fetal weights, cardiovascular abnormalities, wavy ribs and decreased number of ossified sacrococcygeal vertebral bodies. The developmental NOEL in the rat oral and dermal developmental toxicity studies were 10 and 100 mg/kg/day, respectively. The response in rabbits was very different from that in rats. No developmental toxicity was noted in rabbits at doses up to 3000 mg/kg/day, a dose well above the maternal NOEL of 1000 mg/kg/day.

Mechanistic studies indicate that the effects seen in the rat are highly unlikely to occur in the human and that flumioxazin would not be a developmental toxicant in the human.

REPRODUCTION: Reproductive toxicity was observed in F1 males, P1 females and F1 females at 300 ppm Flumioxazin Technical, the highest dose tested and a dose that also produced signs of systemic toxicity. Toxicity was also observed in the F1 and F2 offspring at doses of 200 ppm and greater.

MUTAGENICITY: Flumioxazin Technical was not mutagenic in most *in vitro* assays: gene mutation and a chromosome aberration assay in the absence of metabolic activation. In three *in vivo* assays, chromosome aberration, unscheduled DNA synthesis and micronucleus assay, Flumioxazin Technical was not mutagenic. The only positive response was observed in the *in vitro* chromosome aberration assay in the presence of metabolic activation. Overall, Flumioxazin Technical does not present a genetic hazard.

TOXICITY OF PYROXASULFONE TECHNICAL:

SUBCHRONIC: Pyroxasulfone related effects include increased AST, slight liver and kidney weight increases, increased cardiomyopathy, centrilobular hepatocellular hypertrophy and hyperplastic urinary bladder mucosa. The NOAEL in rats was 50 ppm. No neurotoxicity was observed at acute doses to rats as high as 2000 mg/kg.

CHRONIC/CARCINOGENICITY: Pyroxasulfone produced an increased incidence of urinary bladder transitional cell papillomas in male rats in a two-year carcinogenicity study.

REPRODUCTION: Pyroxasulfone did not produce effects on fertility or the embryo at the dosage of which general toxicity to parental animals was observed.

MUTAGENICITY: Pyroxasulfone is not mutagenic according to results for an *in vitro* reverse mutation test, chromosomal aberration test and *in vivo* mouse bone marrow micronucleus test.

For a summary of the potential for adverse health effects from exposure to this product, refer to Section 2. For information regarding regulations pertaining to this product, refer to Section 15.

12. ECOLOGICAL INFORMATION**AVIAN TOXICITY:**

Based upon EPA designation, Flumioxazin Technical is practically non-toxic to avian species. The following results were obtained from studies with Flumioxazin Technical:

Oral LD₅₀ bobwhite quail: greater than 2250 mg/kg
Dietary LC₅₀ bobwhite quail: greater than 5620 ppm
Dietary LC₅₀ mallard duck: greater than 5620 ppm.

Flumioxazin Technical in the diet. In mallard ducks, a slight, but not statistically significant reduction in hatchlings and 14-day old survivors was observed. Based on a possible, slight effect on egg production at 500 ppm, the NOEL for this study was 250 ppm.

The following results were obtained from studies with Pyroxasulfone Technical:

LD₅₀ bobwhite quail: greater than 2250 mg/kg

AQUATIC ORGANISM TOXICITY: Based upon EPA designation, Flumioxazin Technical is slightly to moderately toxic to freshwater fish; moderately toxic to freshwater invertebrates; moderately toxic to estuarine/marine fish and moderately to highly toxic to estuarine/marine invertebrates, based on the following tests:

96-hour LC₅₀ rainbow trout: 2.3 mg/L
 96-hour LC₅₀ bluegill sunfish: greater than 21 mg/L
 48-hour LC₅₀ Daphnia magna: greater than 5.5 mg/L
 96-hour LC₅₀ sheepshead minnow: greater than 4.7 mg/L
 96-hour (shell deposition) EC₅₀ eastern oyster: 2.8 mg/L
 96-hour LC₅₀ mysid shrimp: 0.23 mg/L
 Fish early life-stage (rainbow trout): NOEC >7.7 µg/L, <16 µg/L
 Chronic toxicity (mysid shrimp): NOEC >15 µg/L, <27 µg/L
 Chronic toxicity (Daphnia magna): NOEC >52 µg/L, <99 µg/L.

Pyroxasulfone Technical is very toxic to aquatic organisms; special attention should be given to aquatic plants. Based upon EPA designation, the following test results are based on Pyroxasulfone Technical:

96-hour LC₅₀ rainbow trout: greater than 2.2 mg/L
 96-hour LC₅₀ bluegill: greater than 2.8 mg/L
 48-hour LC₅₀ Daphnia magna: greater than 4.4 mg/L
 96-hour LC₅₀ sheepshead minnow: greater than 3.3 mg/L
 96-hour EC₅₀ algae = 0.00038 mg/L
 7-day EC₅₀ Spirodela polyrhiza = 0.0055 mg/L
 14-day LC₅₀ Earthworm = 997 mg/kg

OTHER NON-TARGET ORGANISM TOXICITY:

Flumioxazin Technical is practically non-toxic to bees. The acute contact LC₅₀ in bees was greater than 105 µg/bee.
 Pyroxasulfone Technical is practically non-toxic to bees. The acute contact (48-hour) LD₅₀ in bees was greater than 100 µg/bee.

OTHER ENVIRONMENTAL INFORMATION:

This product is toxic to non-target plants and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below mean high water mark. Do not apply where runoff is likely to occur. Do not apply where weather conditions favor drift from areas treated. Do not contaminate water when cleaning equipment or disposing of equipment washwater or rinsate.

13. DISPOSAL CONSIDERATIONS

END USERS MUST DISPOSE OF ANY UNUSED PRODUCT AS PER THE LABEL RECOMMENDATIONS.

PRODUCT DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure 2 more times.

DISPOSAL METHODS: Check government regulations and local authorities for approved disposal of this material. Dispose of in accordance with applicable laws and regulations.

14. TRANSPORTATION INFORMATION

DOT (ground) SHIPPING NAME: Herbicide, solid, non-regulated
EMERGENCY RESPONSE Not applicable
GUIDEBOOK NO.:

ICAO/IATA SHIPPING NAME: UN3077 Environmentally Hazardous Substance, Solid, N.O.S. (Flumioxazin, Pyroxasulfone), 9, III, Marine Pollutant
REMARKS:
 •Single or inner packaging less than 5 L (liquid) or 5 Kg net (solids) excepted from Dangerous Goods regulations – see IATA Special Provision A197
 •For US shipping, Emergency Response Guidebook No. 171

IMDG SHIPPING NAME: UN3077 Environmentally Hazardous Substance, Solid, N.O.S. (Flumioxazin, Pyroxasulfone), 9, III, Marine Pollutant
REMARKS:
 •Single or inner packaging less than 5 L (liquid) or 5 Kg net (solids) excepted from Dangerous Goods regulations – see IMDG 2.10.2.7
 •For US shipping, Emergency Response Guidebook No. 171
EMS NO.: F-A, S-F

15. REGULATORY INFORMATION

EPA-FIFRA LABEL INFORMATION THAT DIFFERS FROM OSHA-GHS REQUIREMENTS:

This material is a pesticide product registered by the EPA under FIFRA and is subject to certain labeling requirements under federal pesticide law. These requirements may differ from the classification criteria and hazard information required by OSHA GHS for safety data sheets, and for workplace labels of non-pesticide chemicals. The following is the hazard information as required on the FIFRA pesticide label:

EPA FIFRA SIGNAL WORD: CAUTION

- *Harmful if inhaled or absorbed through skin.*
- *Moderately irritating to the skin.*
- *Causes moderate eye irritation*
- *Avoid breathing dust or spray mist*
- *Avoid contact with eyes, skin and clothing*
- *Keep out of reach of children.*

PESTICIDE REGULATIONS: All pesticides are governed under FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act). Therefore, the regulations presented below are pertinent only when handled outside of the normal use and applications of pesticides. This includes waste streams resulting from manufacturing/formulation facilities, spills or misuse of products, and storage of large quantities of products containing hazardous or extremely hazardous substances.

U.S. FEDERAL REGULATIONS: Ingredients in this product are reviewed against an inclusive list of federal regulations. Therefore, the user should consult appropriate authorities. The federal regulations reviewed include: Clean Water Act, SARA, CERCLA, RCRA, DOT, TSCA and OSHA. If no components or information is listed in the space below this paragraph, then none of the regulations reviewed are applicable.

Ammonium sulfate

TSCA Inventory List - Present
 SARA 313 Chemicals 1.0% de minimis concentration

lignosulfonic acid, ethoxylated, Na salts

TSCA Inventory List - Present

Agnique Soap L

TSCA Inventory List - Present

SARA (311, 312):

Immediate Health: Yes
 Chronic Health: Yes
 Fire: No
 Sudden Pressure: No
 Reactivity: No

STATE REGULATIONS: Each state may promulgate standards more stringent than the federal government. This section cannot encompass an inclusive list of all state regulations. Therefore, the user should consult state or local authorities. The state regulations reviewed include: California Proposition 65, California Directors List of Hazardous Substances, Massachusetts Right to Know, Michigan Critical Materials List, New Jersey Right to Know, Pennsylvania Right to Know, Rhode Island Right to Know and the Minnesota Hazardous Substance list. For Washington State Right to Know, see Section 8 for Exposure Limit information. For Louisiana Right to Know refer to SARA information listed under U.S. Regulations above. If no components or information is listed in the space below this paragraph, then none of the regulations reviewed are applicable.

Hydrated Amorphous Silica

MA Right To Know Present
 NJ Right To Know 3510
 PA Right To Know Present
 RI Right To Know Listed
 MN Hazardous Substance Present

For information regarding potential adverse health effects from exposure to this product, refer to Sections 2 and 11.

16. OTHER INFORMATION

REASON FOR ISSUE: Updated information to meet OSHA Hazcom 2012 (GHS) regulations. Updated transportation information.
SDS NO.: 0438
EPA REGISTRATION NUMBER: 59639-193
REVISION NUMBER: 1
REVISION DATE: 05/15/2015
SUPERCEDES DATE: 05/15/2015
RESPONSIBLE PERSON(S): Valent U.S.A. Corporation, Corporate EH&S, (925) 256-2803

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED 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 is regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling. 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-approved label.

The information in this SDS is based on data available to us as of the revision date given herein, and believed to be correct. Contact Valent U.S.A. Corporation to confirm if you have the most current SDS.

Judgments as to the suitability of information herein for the individual's own use or purposes are necessarily the individual's own responsibility. Although reasonable care has been taken in the preparation of such information, Valent extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the individual's purposes or the consequences of its use.

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