



Safety Data Sheet (GHS)

1. IDENTIFICATION

Product identifier

PRODUCT NAME: Fierce® Herbicide

PCPA REGISTRATION NUMBER: 31117
VC NUMBER(S): 1869
Synonyms Torpedo Herbicide (Reg. No. 31559), Fierce Manufacturing Use Product (Reg. No. 31863) and Fierce Master Herbicide (Reg. No. 33116)

PRODUCT DESCRIPTION: Herbicide

Fierce is a Registered trademark of Valent U.S.A. LLC

Recommended use of the chemical and restrictions on use

Recommended Use Use in accordance with label directions

Restrictions on use No information available

Details of the supplier of the safety data sheet

MANUFACTURER/DISTRIBUTOR
 VALENT CANADA, INC.
 3-728 Victoria Road South
 Guelph, Ontario N1L-1C6
 (519) 767-9262
 www.valent.com

EMERGENCY TELEPHONE NUMBERS
 HEALTH EMERGENCY OR SPILL (24 hr):
 (800) 682-5368
 TRANSPORTATION (24 hr.): CHEMTREC
 (800) 424-9300 or (202) 483-7616

24 Hour Emergency Phone Number: 800-682-5368

Restrictions on emergency number None

2. HAZARDS IDENTIFICATION

Classification: Per WHMIS 2015
 This product has been classified under the Guidelines of 2015 Health Canada requirements and the implementation of the GHS (Revision 5) under HPR and the HPA.

Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2B
Reproductive toxicity	Category 2

Label elements

WARNING

Hazard statements

Harmful if inhaled
Suspected of damaging fertility or the unborn child
Causes skin and eye irritation.

**Precautionary Statements - Prevention**

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Contaminated work clothing should not be allowed out of the workplace

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Skin

IF ON SKIN: Wash with plenty of water and soap
If skin irritation or rash occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a POISON CENTER or doctor if you feel unwell

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

OTHER INFORMATION

Very toxic to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS**Substance**

Not applicable.

Mixture

Emergency Telephone: (800) 682-5368
REVISION NUMBER: 5

SDS NO.: CAN-0438
REVISION DATE: 09/24/2018

Synonyms Torpedo Herbicide (Reg. No. 31559), Fierce Manufacturing Use Product (Reg. No. 31863) and Fierce Master Herbicide (Reg. No. 33116).

Chemical name	CAS No.	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Flumioxazin	103361-09-7	33.5	-	-
Pyroxasulfone	447399-55-5	42.5	-	-
Hydrated Amorphous Silica	112926-00-8	0.45 - 0.55 *	-	-
Other ingredients	Various CAS#s	21 - 26	-	-

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures

General advice	Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.
Inhalation	Move the person to fresh air. If the person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.
Eye contact	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, and after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
Skin contact	Take off contaminated clothing. Wash with soap and water. Wash off immediately with plenty of water for at least 15-20 minutes. If symptoms persist, call a physician.
Ingestion	Call a physician or poison control centre immediately. Have patient sip a glass of water, if able to swallow. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Carbon dioxide, dry chemical, foam, or water.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.
Specific hazards arising from the	No information available.

chemical

Hazardous combustion products: Thermal decomposition or combustion may product harmful/irritant gas or fume such as nitrogen oxides, carbon oxides, hydrogen fluoride or organic compounds.

Explosion data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures**

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Other information Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

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

Methods for cleaning up 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**Precautions for safe handling**

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Take off contaminated clothing and wash before reuse. Do not eat, drink or smoke when using this product. Remove contaminated clothing and shoes.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep/store only in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Do not put formulaton or dilute spray solution into food or drink containers. Do not contaminate food or feed stuffs. Keep out of the reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters**

Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical name	Alberta	British Columbia	Ontario	Quebec
Hydrated Amorphous Silica		TWA: 4 mg/m ³ TWA: 1.5 mg/m ³		TWA: 6 mg/m ³

Appropriate engineering controls

Engineering controls Showers
 Eyewash stations
 Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection Wear suitable gloves.

Skin and body protection Wear suitable protective clothing. Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves, shoes plus socks. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES**Information on basic physical and chemical properties**

Physical state Free-flowing granules
Appearance granules
Colour Brown
Odour musty
odor threshold: No information available

PROPERTIES	Values	Remarks • Method
pH	6.72 (1% suspension)	@ 22° C
Melting point/freezing point	No Data Available	None known
Boiling point/boiling range	No data available	None known
Flash point	No Data Available	None known
Evaporation rate	No Data Available	None known
Flammability (solid, gas)	No Data Available	None known
Flammability Limits in Air		None known
Upper flammability limits	No Data Available	
Lower Flammability Limit:	No Data Available	
Vapour pressure	No Data Available	None known
Vapour density	No Data Available	None known
Relative density	No Data Available	None known
Water solubility	No Data Available	None known
Solubility in other solvents	No Data Available	None known
Partition coefficient	No Data Available	None known
Autoignition temperature	No Data Available	None known
Decomposition temperature	No Data Available	None known
Kinematic viscosity	No Data Available	None known

Dynamic viscosity No Data Available None known

OTHER INFORMATION

Explosive properties No information available.
 Oxidizing properties No information available.
 Softening point No information available
 Molecular weight No information available
 VOC (EPA METH.24) (G/L): No information available
 Liquid Density 42.4 lb/ft³
 Bulk density No information available

10. STABILITY AND REACTIVITY

Reactivity No information available.
 Chemical stability Stable under normal conditions.
 Possibility of Hazardous Reactions None under normal processing.
 Hazardous polymerisation None under normal processing.
 Conditions to avoid None known based on information supplied.
 Incompatible materials None known based on information supplied.
 Hazardous Decomposition Products: Thermal decomposition or combustion may produce nitrogen oxides, carbon oxides, hydrogen fluoride.

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	Not Listed	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

No reproductive effects were observed in bobwhite quail exposed to 500 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 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: 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 TGAI is very toxic to aquatic organisms; special attention should be given to aquatic plants.

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**Waste treatment methods**

Waste from residues/unused products Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORTATION INFORMATION

DOT (ground) shipping name: Not regulated for domestic ground transport by US DOT or Canada TDG.

Remarks: None

Emergency Response

Guidebook No.: Not applicable

ICAO/IATA proper 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 (liquids) or 5 kg net (solids) excepted from Dangerous Goods regulations -- see IATA Special Provision A197.

IMDG proper 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.

EMS No.: F-A, S-F

15. REGULATORY INFORMATION**Safety, health and environmental regulations/legislation specific for the substance or mixture**

Chemical name	Canada DSL Inventory List -	Canada NDSL Inventory List -	EINECS Inventory List -
Hydrated Amorphous Silica	Present		

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

PESTICIDE REGULATIONS: All pesticides are governed under PCPA (Pest Control Products 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.

PROVINCIAL REGULATIONS: This product did not trigger any provincial regulations.

International Regulations

The Montreal Protocol on Substances that Deplete the Ozone Layer Not applicable

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Rotterdam Convention Not applicable

16. OTHER INFORMATION

REASON FOR ISSUE: Updated information to meet WHMIS 2015 (GHS) regulations.
SDS NO.: CAN-0438
PCPA REGISTRATION NUMBER: 31117
REVISION NUMBER: 5
REVISION DATE: 09/24/2018
SUPERCEDES DATE: January 13, 2014
RESPONSIBLE PERSON(S): Valent U.S.A. LLC, Corporate EH&S, (925) 256-2803

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The Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE PMRA-APPROVED PRODUCT LABEL (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.

The product label provides information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products is regulated by the PMRA under the authority of the *Pest Control Products Act* through the product label. All necessary hazard classification and appropriate precautionary use, storage, and disposal information is set forth on that label or labeling accompanying the pesticide or to which reference is made on the label. It is a violation of federal law to use a PMRA-registered pesticide product in any manner inconsistent with its labeling.

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