



Safety Data Sheet - GHS

1. IDENTIFICATION: CHEMICAL PRODUCT AND COMPANY

PRODUCT NAME: PERPETUO™ HERBICIDE
EPA REGISTRATION NUMBER: 59639-242
VC NUMBER(S): 2085; 2104
PRODUCT DESCRIPTION: Herbicide Mixture

Perpetuo is a trademark of Valent U.S.A. LLC

MANUFACTURER/DISTRIBUTOR

VALENT U.S.A. LLC
P.O. Box 5075
4600 Norris Canyon Road
San Ramon, CA 94583

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

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA-required classifications on the product label. Certain sections of this SDS are superseded by federal law under EPA FIFRA for a registered pesticide. Please see Section 15, REGULATORY INFORMATION for an explanation.

Classification - (per U.S. OSHA 29 CFR 1910.1200 (Hazcom 2012))

Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Specific target organ toxicity (repeated exposure)	Category 2 - nervous system, liver, kidney, heart, urinary bladder

Label elements**EMERGENCY OVERVIEW****WARNING****Hazard statements**

Emergency Telephone: (800) 892-0099
REVISION NUMBER: 3

SDS NO.: 0549
REVISION DATE: 09/08/2020

Harmful if inhaled

Precautionary statements

Prevention

Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

Response

Call a POISON CENTER or doctor/physician if you feel unwell

Eyes None.

Skin None.

Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Ingestion None.

FIRE None.

Spill None.

Storage

None

Disposal

None

Hazards not otherwise classified (HNOC)

Other Information

- Very toxic to aquatic life with long lasting effects.

For information on Transportation requirements, see Section 14.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Weight-%	TRADE SECRET
Flumiclorac-pentyl ester	87546-18-7	6.34	
Pyroxasulfone	447399-55-5	18.38	
Propylene glycol	57-55-6	5.0 - 9.0	*
Other ingredients	NO CAS #	55 - 65	

* 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 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 °C

Flash point °F

EXTINGUISHING MEDIA:

Small Fires: Foam, carbon dioxide, or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

Large fires: Water spray, fog, dry chemical powder, regular foam, carbon dioxide.

DO NOT USE WATER JET OR STRAIGHT STREAMS.

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. Keep upwind. Isolate hazard area. Avoid inhalation of smoke and fumes. Use water or foam to reduce fumes. Do not touch spilled material. If possible, move containers from area. Extinguish only if flow of water can be stopped. Use flooding amounts of water as a fog. Cool containers with flooding amounts of water from as far a distance as possible. Avoid breathing vapors.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides, hydrogen chloride, phosgene, chloride compounds, soot

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

CONTAINMENT: Avoid runoff into storm sewers and ditches which lead to waterways. Contain spilled liquids with dry sorbents.

Small spills: Material on the floor or other impervious surfaces should be absorbed with an inert absorbent material such as sand, granular clay, sawdust, Fuller's earth, etc. and discard as non-hazardous waste. Clean spill area with soap and water and rinse thoroughly.

CLEANUP: Rinse spill area with small amount of soapy water. Contain and absorb the rinsate with inert absorbents and place into the same disposal container. Area can be washed with water to remove the last trace of residue. Do not allow water to contaminate water supplies or sewers. Disposal to landfill in accordance with federal, state and local regulations.

7. HANDLING AND STORAGE

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

HANDLING:

Applicators and other handlers must wear long-sleeved shirt and long pants, chemical-resistant gloves, shoes plus socks. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Use only in well ventilated area. Avoid contact with skin and eyes. Do not breathe spray mist.

STORAGE:

Keep pesticide in original container. Do not store or transport near food or feed. Do not contaminate food or feed. Do not put concentrate into food or drink containers. Do not dilute concentrate in food or drink containers. Store in a cool, dry place, away from heat, flame and strong acids. Keep container closed when not in use. Do not store at temperatures below 32°F. If the product is exposed to temperatures below 32°F, thaw at room temperature to 50°F or warmer and shake gently to unify the product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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

Applicators and other handlers must wear: long-sleeved shirt and long pants, socks plus shoes and chemical-resistant gloves made of any waterproof material. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wear safety glasses. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

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

RESPIRATORY PROTECTION: Use adequate ventilation to keep the airborne concentration of this material below the recommended exposure standards.

SKIN & HAND PROTECTION: Avoid contact with skin or clothing. Skin contact can be minimized by wearing protective clothing including gloves.

EXPOSURE LIMITS

Chemical name	ACGIH Exposure Limits	OSHA Exposure Limits	Manufacturer's Exposure Limits
Flumiclorac-pentyl ester	None	None	None
Pyroxasulfone	None	None	None
Propylene glycol	None	None	None

Other ingredients	None	None	None
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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid		
Appearance	Viscous	Odor	Faint characteristic odor
Color	White	Odor threshold	No information available

<u>PROPERTIES</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	5.0 - 7.0	
Melting point/freezing point	No information available	
Boiling point/boiling range	No information available	
Flash point	No information available	
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	9.3 lb/gal.	
Water solubility	No information available	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	
Liquid Density	No information available	
Bulk density	No information available	

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:

Emergency Telephone: (800) 892-0099
 REVISION NUMBER: 3

SDS NO.: 0549
 REVISION DATE: 09/08/2020

The following information is for the formulated product.

Oral Toxicity LD ₅₀ (rats)	>2,000 mg/kg	EPA Tox Category	III
Dermal Toxicity LD ₅₀ (rabbits)	>2,000 mg/kg	EPA Tox Category	III
Inhalation Toxicity LC ₅₀ (rats)	>2.12 mg/kg	EPA Tox Category	IV
Eye Irritation (rabbits)	Mildly irritating	EPA Tox Category	III
Skin Irritation (rabbits)	Slightly irritating	EPA Tox Category	IV
Skin Sensitization (guinea pigs)	Non-sensitizer	EPA Tox Category	Not applicable

CARCINOGEN CLASSIFICATION

Chemical name	IARC Group 1 or 2	OSHA - Select Carcinogens	NTP Carcinogen List
Pyroxasulfone	Not listed	Not listed	Not listed
Propylene glycol	Not listed	Not listed	Not listed
Flumiclorac-pentyl ester	Not listed	Not listed	Not listed
Other ingredients	Not listed	Not listed	Not listed

TOXICITY OF FLUMICLORAC PENTYL TECHNICAL

SUBCHRONIC: Compound-related effects noted at very high dose levels of Flumiclorac Pentyl Technical in rodents and/or dogs included: increased liver and kidney weights; histological changes in the kidney and liver; slight changes in blood biochemistry parameters; decreased red blood cell count, hemoglobin and hematocrit and slight decreases in body weight. The NOEL in rats and mice was 1000 ppm.

CHRONIC/CARCINOGENICITY: Effects of long-term high dose exposures to Flumiclorac Pentyl Technical in rodents and/or dogs consisted primarily of increases in kidney and liver weights, slight changes in blood biochemistry, and histological changes in the liver. The lowest NOEL was 300 ppm in the mouse study. Flumiclorac Pentyl Technical was not carcinogenic in either rats or mice.

DEVELOPMENTAL TOXICITY: No developmental toxicity was observed in rats or rabbits even at maternally toxic levels of Flumiclorac Pentyl Technical. In rabbits the maternal NOEL was 400 mg/kg/day and the developmental NOEL was 800 mg/kg/day. In rats the maternal and developmental NOELs were 1500 mg/kg/day.

REPRODUCTION: Reproductive toxicity (higher rate of F1 pup deaths on Day 0 of lactation) as well as systemic toxicity were observed in rats at doses of 10,000 and 20,000 ppm Flumiclorac Pentyl Technical in a two-generation rat reproduction study. A repeat study for one generation did not confirm the reproductive toxicity finding. Thus, Flumiclorac Pentyl Technical is not considered a reproductive toxicant.

MUTAGENICITY: Flumiclorac Pentyl Technical was not mutagenic in most assays: gene mutation (with and without S-9 activation), unscheduled DNA synthesis, *in vitro* chromosomal aberration (with S-9), and *in vivo* mouse micronucleus. Only a weak positive response was observed in the *in vitro* chromosomal aberration assay in the absence of S-9 metabolic activation. Overall, Flumiclorac Pentyl Technical is not 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 was not carcinogenic in lifetime feeding studies in mice. Pyroxasulfone produced an increased incidence of urinary bladder transitional cell papillomas in male rats in a two-year carcinogenicity study. The tumors seen with Pyroxasulfone were caused through a non-genotoxic mechanism, which is not relevant at low doses.

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

MUTAGENICITY: Pyroxosulfone TGA1 was negative for the Ames test and chromosomal aberration test. 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 the components of this product, it is practically non-toxic to birds. The following results were obtained from studies with Pyroxasulfone Technical:

LD₅₀ bobwhite quail: greater than 2250 mg/kg

Flumiclorac Pentyl Technical is practically non-toxic to avian species. The following results were obtained from studies with Flumiclorac Pentyl Technical:

LD₅₀ quail: greater than 2250 mg/kg

LC₅₀ duck: greater than 5620 ppm

LC₅₀ mallard: greater than 5620 ppm

Quail Reproduction NOEC: 500 ppm

Duck Reproduction NOEC: 250 ppm.

AQUATIC ORGANISM TOXICITY: The toxicity of Flumiclorac Pentyl Technical to freshwater fish and invertebrates ranges from slight to moderate. To saltwater/estuarine fish and invertebrates, it's toxicity ranges from slight to moderate:

96-hour LC₅₀ bluegill sunfish: 17.4 mg/L

96-hour LC₅₀ rainbow trout: 1.1 mg/L

48-hour LC₅₀ Daphnia magna: greater than 38.0 mg/L

96-hour LC₅₀ sheepshead minnow: greater than 24 mg/L

96-hour EC₅₀ eastern oyster: greater than 1.8 mg/L

96-hour LC₅₀ mysid shrimp: 0.56 mg/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: Based upon an evaluation of the components, this product is practically non-toxic to bees. Pyroxasulfone Technical is practically non-toxic to bees. The acute contact (48-hour) LD₅₀ in bees was greater than 100 µg/bee. Flumiclorac Pentyl Technical is practically non-toxic to bees. The acute contact LD₅₀ is greater than 106 µg/bee.

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. Offer for recycling, if available; otherwise dispose of in a sanitary landfill or by incineration.

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: Not regulated for domestic ground transport by U.S. DOT

EMERGENCY RESPONSE

GUIDEBOOK NO.: Not applicable

ICAO/IATA SHIPPING NAME: UN 3082 Environmentally Hazardous Substance, Liquid, N.O.S. (Flumiclorac Pentyl, 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.

IMDG SHIPPING NAME: UN 3082 Environmentally Hazardous Substance, Liquid, N.O.S. (Flumiclorac Pentyl, 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:**

Pesticide products in the U.S. are registered by the EPA under FIFRA and are 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 swallowed or absorbed through skin.*
- *Causes moderate eye irritation*
- *Avoid contact with eyes, skin and clothing.*
- *Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.*

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.

SARA (311, 312):

Immediate Health:	Yes
Chronic Health:	No
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.

Propylene glycol

NJ Right To Know	3595
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:	Update the Manufacturer's address.
SDS NO.:	0549
EPA REGISTRATION NUMBER:	59639-242
REVISION NUMBER:	3
REVISION DATE:	09/08/2020
SUPERCEDES DATE:	02/06/2020
RESPONSIBLE PERSON(S):	Valent U.S.A. LLC, Corporate EH&S, (925) 256-2803

The information provided in this Safety Data Sheet (SDS) is provided in good faith and believed to be accurate at the time of preparation of the SDS. However, to the extent consistent with applicable law, Valent U.S.A. LLC and its subsidiaries or affiliates extend no warranties, make no representations, and assume no responsibility as to the accuracy, suitability, or completeness of such information. Additionally, to the extent consistent with applicable law, neither Valent U.S.A. LLC nor any of its subsidiaries or affiliates represents or guarantees that this information or product may be used without infringing the intellectual property rights of others. Except to the extent a particular use and particular information are expressly stated on the product label, it is the users' own responsibility to determine the suitability of this information for their own particular use of this product. If necessary, contact Valent U.S.A. LLC to confirm that you have the most current product label and SDS.

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 as required by the Occupational Health and Safety Act (29 CFR 1910.1200, "Hazcom").

The product label provides information specifically for product use in the ordinary course. 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.

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