



SAFETY DATA SHEET (SDS) ID: EPA Reg. No. 74530-91, ZONE Defense Herbicide

SECTION 1: Product and Company IDs

Product name: ZONE Defense Herbicide
Product use / type: Herbicide
Restrictions on use: See product label.
SDS ID: EPA Reg. No.: 74530-91
Chemical name / active ingredients: See Section 3.
Manufacturer / Registrant Info:
 HELM Agro US, Inc. 401 E. Jackson St.
 Suite 1600, Tampa, FL 33602
 (813)-621-8846, info@helmagro.com
Chemical Emergency Number: 1-800-424-9300 (Chemtrec)

SECTION 2: Hazard Communication

This chemical is considered hazardous according to the OSHA Hazard Communication Standard 2012 (29 CFR 1910.1200).

Signal Word: Warning. **Pictograms:**



Reproductive Toxicity: Category 2
Acute Inhalation: Category 4
Acute Oral: Category 4
Specific Target Organ Toxicity – Repeated Exp.: Category 2

Hazard Statements:

- Harmful if inhaled. Harmful if swallowed.
- May cause respiratory irritation.
- Causes damage to organs through prolonged or repeated exposure. Suspected of damaging the unborn child.

Precautionary Statements:

- Refer Section 4, First Aid Measures.
- May cause mild eye irritation.
- May cause slight skin irritation. Prolonged exposure to this product is suspected to cause reproductive harm.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Wash thoroughly after handling.
- Avoid breathing mist/vapors/spray.
- Do not eat drink or smoke when using this product.
- Wear protective gloves/eye protection.
- Use only outdoors or in a well-ventilated area.
- Wear respiratory protection.
- If experiencing respiratory symptoms: Immediately call a poison center.
- If exposed or concerned, get medical attention. Call POISON CENTER or doctor/physician if you feel unwell.
- Refer Sections 7 and 13.

Other Information / Potential Hazards:

- Long-term, chronic toxicity to aquatic life.

SECTION 3: Ingredient Composition

Chemical Name	CAS #	% Composition <small>(exact values may be withheld as trade secrecy)</small>
Sulfentrazone	122836-35-5	62.2
Flumioxazin	103361-09-7	22.8
Other:	Mixture; N/R as trade** secrecy	15**

** Values are not product specifications.

SECTION 4: First Aid Measures

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 a poison control center or doctor. Do not give anything by mouth to an unconscious person. **If on skin or clothes:** Wash and remove contaminated clothing and shoes. Wash before reuse. Rinse skin immediately with plenty of water for 15 or 20 minutes. Call a poison control center/doctor for treatment

advice. Sensitized persons should avoid reuse. **If in eyes:** 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. **If inhaled:** Move person to fresh air. If person is not breathing, call 911 or get medical help, then give artificial respiration, preferably with the aid of a pocket mask equipped with a one-way valve. Call a poison control center or doctor for further treatment advice. **First Aid Note:** Have this safety data sheet, the product container or label with you when calling a poison control center or doctor or going for treatment. **Physician:** Protect self from material. Treatment is controlled removal of exposure followed by symptomatic and supportive care. **Other:** May cause mild eye irritation. May cause a slight skin reaction. Harmful if inhaled or if swallowed. Prolonged exposure may cause reproductive harm.

SECTION 5: Fire Fighting Measures

Flammable

properties: N/A. **Extinguishing media:** Water fog, dry chemical, alcohol resistant foam or CO2. **Unsuitable extinguishing media:** High pressure water streams. **Firefighting measures:** Evacuate area. Use extinguishing media appropriate for surrounding fire. Prevent contaminated firefighting waters and spillage from entering sewers, drains and waterways. Contain run-off water with temporary dike. Prevent use of contaminated buildings, area and equipment until decontamination. **Protective equipment and precautions for firefighters:** Wear full protective firefighting gear including self-contained breathing apparatus pressure demand (MSHA/NIOSH approved or equivalent). Decontaminate equipment after use. **Hazardous decomposition products:** This product is not combustible. Thermal decomposition may produce oxides of carbon, nitrogen, and sulfur, and fluorine.

SECTION 6: Accidental Release Measures

Personal precaution:

Isolate and post, and clean spill area. Keep unnecessary personnel, pets and livestock from spill area. Wear protective gloves / clothing and eye protection. Avoid breathing, wear protection. Avoid contact with eyes, skin and clothing. Ensure adequate ventilation. See section 8 for personal protective equipment. **Environmental precautions:** Prevent further spillage if safe to do so. Prevent entry into waterways, sewers, basements, or confined areas. Do not flush into surface water or sanitary sewer system. Avoid unintentional releases to the environment. Report spills as required by local and federal regulations. **Methods for containment:** Contain spill with inert material (e.g. sand, silica gel, binder). Clean immediately. **Methods for cleanup:** Pick up and transfer to properly labeled containers for disposal. Dust deposits should not be allowed to accumulate on surfaces. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Thoroughly clean tools and contaminated surfaces with detergent and water. Place rinse waters into disposal containers. Place leaking containers in oversize drums for transport and disposal.

SECTION 7: Handling and Storage

Precautions for safe

handling: Wear protective attire. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mist. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Avoid contamination of work clothing; remove and clean after handling. **Precautions for safe storage:** Store and handle in accordance with good industrial hygiene practices. Keep container tightly closed. Store in original container in a cool, dry and well-ventilated place away from children and animals. Keep away from incompatible materials. For Nonrefillable containers, Do not reuse or refill this container. Empty containers may contain product residues which can be hazardous. Follow all SDS precautions when handling empty containers. Refer product label. Cleaning before refilling is the responsibility of the refiller. When empty, return to point of sale. **Incompatible storage situations:** Store product in original container only. Keep container closed when not in use, away from food or feed, fertilizer and other pesticides. Do not put formulation or spray solution in food or drink containers. Store in a cool, dry place and avoid excess heat. Do not store below 30°F degrees. Protect container from physical damage. Do not contaminate water, food or feed by storage or disposal or cleaning of equipment.

SECTION 8: Exposure Control / Protection

The following

recommendations for exposure controls and personal protection are intended for the manufacture, formulation, and packaging of this material. All forms of application should refer to the product label for personal protection equipment.

**Exposure Guidelines:**

Sulfentrazone	None Established
Flumioxazin	None Established

Engineering controls: Emergency eye wash/drench. Shower or suitable water supply near the work area. Ensure adequate ventilation, or provide local exhaust.
Personal protective equipment eye/face protection: Safety glasses with side-shields. If potential for eye contact to occur, wear chemical tight goggles.
Body/skin protection: Long sleeved shirt, long pants, shoes plus socks. Applicators must wear chemical resistant clothing and footwear plus socks. Wash work clothing before reuse. Launder separately from other laundry.
Hand protection: Wear chemical resistant gloves / hand protection.
Respiratory protection: If handling without sufficient ventilation or excess airborne exposure, wear a dust/mist filtering respirator with organic cartridge(s) or pesticide rated filters. Consult personal protective equipment manufacturers recommendations for cleaning and maintenance.

SECTION 9: Physical & Chemical Properties

Physical state: Solid.
Appearance: Tan. **Odor:** Faint. **pH:** 4.96 (1% solution). **Melting point:** Not applicable. **Boiling point:** No information available. **Flash point:** Not expected to flash. **Explosive properties:** N/A. **Autoignition temperature:** No information available. **Oxidizing properties:** No information available. **Relative density:** 0.5 g/mL @ 20° C. **Water solubility:** Soluble. **Vapor pressure:** N/A. **Dynamic viscosity:** Not listed. **Partition coefficient:** N/A. **Other as commonly listed:** No info available. **Flammability:** Not flammable.

SECTION 10: Stability & Reactivity

Reactivity / Chemical stability: Stable under normal temperature and conditions. **Conditions / Materials to avoid:** Extreme heat, sparks and creation of dust. Avoid temperatures below 30°F degrees. Avoid contact with oxidizing agents. Hazardous polymerization will not occur. **Hazardous decomposition products:** Thermal decomposition may produce oxides of carbon, nitrogen, and sulfur, and fluorine. **Hazardous reactions:** Not expected under normal use.

SECTION 11: Toxicological Information

See Section 4 for information on likely routes of exposure and effects. Product toxicology:
Chronic Effects: Prolonged or repeated exposure to Flumioxazin may adversely affect hematopoietic system. The effects from Flumioxazin seen in rats at high dose levels were hematotoxicity including anemia, and increases in liver, spleen, heart, kidney and thyroid weights. Effects seen in dogs 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.
Sensitization: This product is not expected to cause skin sensitization at concentrations less than or equal to 50% based on the OPPTS 870.2600 Local Lymph Node Assay (LLNA) in Mice.
Carcinogenicity: In a OPPTS 870.4200 Carcinogenicity study with mice and OPPTS 870.4300 Combined Chronic Toxicity/Carcinogenicity study with rats, there was no evidence of carcinogenic effects for Flumioxazin. None of the components of this product are listed as a carcinogen or suspected carcinogen by OSHA, IARC, and NTP.
Reproductive Effects: Flumioxazin is suspected to cause adverse reproductive effects based on animal studies. When tested, Flumioxazin produced 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 sacrocoxygeal vertebral bodies. When tested in rabbits, the response was different from that in rats and no developmental toxicity was noted. In a developmental toxicity study with Sulfentrazone in rats showed evidence of treatment-related developmental toxicity consisted of decreased fetal viability, decreased fetal body weight, and increased incidence of fetal alterations, comprised, for the most part, of skeletal malformations and variations.
Mutagenic Effects: Flumioxazin 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 was not mutagenic. The only positive response was observed in the in vitro chromosome aberration assay in the presence of metabolic activation. A reverse gene mutation assay in Salmonella typhimurium with Sulfentrazone yielded negative results, both with and without metabolic activation. This product is not expected to cause germ cell mutagenicity.
Acute Toxicity:
The following values are based on OPPTS Test Data:
Oral rat LD50: 3129 mg/kg. Inhalation rat LC50: >2.07 mg/L (no mortality). Skin rat LD50: >5000 mg/kg.

SECTION 12: Ecological Information

Ecotoxicity:
Sulfentrazone: 96 hr LC50 Bluegill Sunfish 93.8 ppm, Flumioxazin: 96 hr LC50 Bluegill sunfish >21.0 ppm (0.304 mg/L), 96 hr LC50 Rainbow trout 2.3 ppm (0.033 mg/L), 48 hr EC50 Daphnia pulex 5.5 ppm (0.08 mg/L). This product is expected to be very toxic to the aquatic environment with long lasting effects. Releases to the environment should be avoided. **Persistence and Degradability:** Flumioxazin: Rapidly degradable in water. **Bioaccumulative Potential:** Flumioxazin: Data indicates that Flumioxazin and its major hydrolytic degradation products are unlikely to partition into fatty tissues, so it is considered to have low bioaccumulation potential. **Mobility in Soil:** No data available. This product is known to leach through soil into groundwater under certain conditions because of label use. Use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. DO NOT use on coarse soils classified as sand which have less than 1% organic matter. **Other Adverse Effects:** This pesticide is toxic to non-target plants and marine/estuarine invertebrates and should be used strictly in accordance with the drift and run-off pre-cautions on this label to minimize off-site exposures. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high-water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants in neighboring areas. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment wash waters or rinsate.

SECTION 13: Disposal Information

Product disposal:
Wastes resulting from the use of this product that cannot be used must be disposed in accordance with applicable Federal, State or local regulations at an approved waste disposal facility. Keep out of drains, sewers, ditches and water ways. **Container disposal:** Refer to product label for container disposal. DO NOT contaminate water, food or feed by storage or disposal or cleaning of equipment. Nonrefillable Container: Do not reuse or refill this container. Clean container promptly after emptying. Triple Rinse. Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or by other procedures allowed by state and local authorities.

SECTION 14: Transport Information

U.S. DOT: Not regulated for domestic ground transport. **IMDG* (IATA*):** UN3077, Environmentally hazardous substance, solid, n.o.s. (Flumioxazin), 9, III, Marine Pollutant. *Inner packages with less than 5 kg of solid are exempt per IMDG Code 2.10.2.7 and ICAO Special Provision A197.

SECTION 15: Regulatory Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label: **Signal word:** Caution. **EPA Registration No.:** 74530-91. **Hazards to Humans and Domestic Animals:** Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. **ENVIRONMENTAL HAZARDS:** This pesticide is toxic to non-target plants and marine/estuarine invertebrates and should be used strictly in accordance with the drift and run-off pre-cautions on this label in order to minimize off-site exposures. **DO NOT** apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants in neighboring areas. **DO NOT** apply where runoff is likely to occur. **DO NOT** apply when weather conditions favor drift from treated areas. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate. For more information, read **EPA registered product label and advisories. EPA Registration No.:** 74530-91. **SARA 311/312 Hazard Categories:** Refer Section 2, GHS hazards. **SARA 313:** None. **CERCLA:** N/A. **TSCA:** Components listed or exempt. **Clean Water Act:** N/A. **California Proposition 65:** None listed. **State Right-to-Know Regulations:** None listed.

SECTION 16: Other Information

NFPA Ratings:	Health = 2	Fire = 1	Instability = 0
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Acronyms which may or may not be referenced: ACGIH - American Conference of Governmental Industrial Hygienists; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; CST - Centistokes; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F -



Fahrenheit; FIFRA – Federal Insecticide, Fungicide and Rodenticide Act; GHS – Global Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL – Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; MAK – Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MP - Marine Pollutant; NFPA - National Fire Protection Association; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Revision Date: December 1st, 2023. **Revision no. 2. Reason for Revision:** SDS review and truncate. Confirm/Update Section 14. Review, truncate, and/or update Sections 2, 15 (PRN 2012-1), 16. Address change.

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