

VALOR™ Herbicide

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS 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.

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: VALOR™ Herbicide

VC NUMBER(S): VC-1152

EPA REGISTRATION NUMBER: 59639-99

SYNONYM(S): VALOR™ WDG Herbicide

S-53482 50 WDG Herbicide

V-53482 50 WDG Herbicide

MANUFACTURER

VALENT USA CORPORATION

P.O. Box 8025

1333 N. California Blvd., Suite 600

Walnut Creek, CA 94596-8025

EMERGENCY TELEPHONE NUMBERS

HEALTH EMERGENCY OR SPILL (24 hr): 1-800-892-0099

TRANSPORTATION (24 hr.): CHEMTREC 1-800-424-9300 or (202) 483-7616

PRODUCT INFORMATION

AGRICULTURAL PRODUCTS: (800) 6VALENT

PROFESSIONAL PRODUCTS: (800) 89VALENT

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name (CAS #) [Chemical Name]	Weight Percent	Exposure Limit	Ref.
Flumioxazin * (103361-09-7) [2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propenyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione]	51	None	—
Free Silica (Quartz) (14808-60-7)	<1	%SiO ₂ +2; Total dusts Respirable dust: 10 mg/m ³ /: 30 mg/m ³ / %SiO ₂ +2	OSHA ACGIH
Kaolin Clay (1332-58-7)	30 - 40	5 mg/m ³ respirable fraction; 15 mg/m ³ total dust	OSHA
		2 mg/m ³ respirable fraction	ACGIH
Titanium Dioxide (013463-67-7)	≤ 1	15 mg/m ³ total dust	OSHA
		10 mg/m ³	ACGIH
Other ** including particulates not otherwise classified	50 - 60	15 mg/m ³ total dust; 5 mg/m ³ respirable fraction	OSHA
		10 mg/m ³ inhalable particulate; 3 mg/m ³ respirable particulate	ACGIH

* Active Ingredient

** Other ingredients, which are maintained as trade secrets, are any substances other than an active ingredient contained in this product. Some of these may be hazardous, but their identity is 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 1-800-892-0099 at any time.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION:

— HARMFUL IF INHALED OR ABSORBED THROUGH THE SKIN

— AVOID BREATHING DUST OR SPRAY MIST

— AVOID CONTACT WITH EYES, SKIN OR CLOTHING

— KEEP OUT OF REACH OF CHILDREN

POTENTIAL HEALTH EFFECTS

Acute Toxicity (Primary Routes of Exposure)

Signs and Symptoms of Systemic Effects: No signs or symptoms occurred in animals exposed to high oral or dermal doses of flumioxazin. Exposure to very high concentrations in the air resulted in breathing difficulties, decreased activity and some changes in the tissues of the respiratory system.

Eye: This product is expected to cause brief and/or minor eye irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness and possible swelling.

Skin: This product is expected to cause brief and/or minor irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness and possibly some minor swelling.

This product is not expected to cause allergic skin reactions.

This product has been shown to be slightly toxic when absorbed through the skin. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Ingestion: This product has been shown to be minimally toxic when ingested. The degree of injury will depend on the amount of material ingested and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Inhalation: This product has been shown to be slightly toxic when inhaled. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above. Exposure to high concentrations may result in respiratory irritation. Signs and symptoms may include, but not be limited to, nasal discharge, sore throat, coughing and difficulty in breathing.

Chronic Toxicity (Including Cancer): Repeated exposures to flumioxazin technical in animals have produced anemia and other blood formation changes, organ weight changes and changes in blood chemistry. Flumioxazin technical did not produce cancer in lifetime feeding studies in laboratory animals.

This material contains a small amount of crystalline silica. Repeated inhalation of large amounts of silica dust over an extended period of time may result in a progressive, disabling disease, silicosis. Symptoms include shortness of breath, chest pain and reduced lung function.

The International Agency for Research on Cancer (IARC) has determined that respirable crystalline silica is a probable carcinogen. The National Toxicology Program (NTP) classifies respirable crystalline silica as a substance that may reasonably be anticipated to be a carcinogen.

Teratology (Birth Defects) Information: Birth defects were produced in the offspring of female rats exposed to flumioxazin technical. No effects were observed in rabbits.

Reproduction Information: Reproductive effects were observed in rats exposed to flumioxazin technical.

Potentially Aggravated Conditions: Individuals with anemia or preexisting diseases of the blood may have increased susceptibility to the toxicity of excessive exposures.

For complete discussion of the toxicology data from which this evaluation was made, refer to Section 11. For Regulatory Information, refer to Section 15.

SECTION 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.

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.

SKIN: 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

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: NA

METHOD: NA

AUTOIGNITION: NA

EXTINGUISHING MEDIA: CO₂, dry chemical, foam, water fog.

FLAMMABLE LIMITS (% by volume in air):

Lower: NA

Upper: NA

NFPA RATINGS: 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: Products of combustion from fires involving this product may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and fire fighting equipment before reuse. Read the entire document.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen. Combustion may produce toxic compounds of nitrogen and fluorine. Incomplete combustion can produce carbon monoxide.

SECTION 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 SPILLS ON LAND:

CONTAINMENT: Reduce airborne dust. Avoid runoff into storm sewers or other bodies of water.

CLEANUP: Clean up spill immediately. Vacuum or sweep up material and place in a disposable container.

Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a disposable container.

FOR SPILLS IN WATER:

CONTAINMENT: This material will dissolve in water. Stop the source of the release. Contain and isolate to prevent further release into soil, surface water and ground water. Notify and consult with appropriate regulatory authorities.

CLEANUP: Clean up spill immediately. Absorb spill with inert material. Vacuum or sweep up and place in a disposable container. For further information, call 1-800-829-0099.

SECTION 7: HANDLING AND STORAGE**END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.**

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, out of direct sunlight.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**END USER MUST READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.**

EYE PROTECTION: Do not get this material in your eyes. Eye contact can be avoided by wearing protective eyewear.

RESPIRATION/VENTILATION: Use this material only in well ventilated areas.

Unless ventilation is adequate to keep airborne concentrations below recommended exposure standards, approved respiratory protection should be worn.

This material may be a respiratory irritant and, unless ventilation is adequate, the use of approved respiratory protection is recommended.

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

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Light brown solid granules.

ODOR: Slight odor.

MELTING POINT: NA

BOILING POINT: NA

BULK DENSITY: 0.663 g/cc at 25°C

SOLUBILITY: Dispensible in water

VAPOR PRESSURE: NA

DISSOCIATION CONSTANT: NA

OCTANOL/WATER PARTITION COEFFICIENT: NA

pH: 6.2 - 6.4 at 20°C (5% solution)

VISCOSITY: NA

CORROSION CHARACTERISTICS: Not corrosive to containers.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: This material is considered chemically and thermally stable.

INCOMPATIBILITY: May react with strong oxidizing agents such as chlorates, nitrates, peroxides, etc.

HAZARDOUS DECOMPOSITION PRODUCTS: NDA

IMPACT EXPLODABILITY: Not explosive

OXIDATION/REDUCTION PROPERTIES: Not reactive

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE (Product Specific Information):

Eye Irritation: Minimal eye irritation clearing in 48 hours. (Toxicity Category III)

Skin Irritation: Slight irritation observed at 72 hours. (Toxicity Category IV)

Dermal Toxicity: The dermal LD₅₀ in rabbits is greater than 2 g/kg. (Toxicity Category III)

Oral Toxicity: The oral LD₅₀ in rats is greater than 5g/kg. (Toxicity Category IV)

Inhalation Toxicity: No rats died in a 4-hour inhalation study at the maximum attainable concentration of 0.969 mg/l. (Toxicity Category III) Exposure to very high concentrations in the air resulted in breathing difficulties, decreased activity and some changes in the tissues of the respiratory system.

Skin Sensitization: This material was not a skin sensitizer in the Magnusson-Kligman guinea pig maximization test.

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.

TERATOLOGY/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.

REPRODUCTION: Reproductive toxicity was observed in F₁ males, P₁ females and F₁ females at 300 ppm, 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 OTHER INGREDIENTS:

This material contains a small amount of crystalline silica. Repeated inhalation of large amounts of silica dust over an extended period of time may result in a progressive, disabling disease, silicosis. Symptoms include shortness of breath, chest pain and reduced lung function.

The International Agency for Research on Cancer (IARC) has determined that respirable crystalline silica is a probable carcinogen. The National Toxicology Program (NTP) classifies respirable crystalline silica as a substance that may reasonably be anticipated to be a carcinogen.

For a summary of the potential for adverse health effects from exposure to this product, refer to Section 3. For information regarding regulations pertaining to this product, refer to Section 15.

SECTION 12: ECOLOGICAL INFORMATION

AVIAN TOXICITY: 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 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.

AQUATIC ORGANISM TOXICITY: 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*: 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): MATC >7.7 ug/l, <16 ug/l

Chronic toxicity (mysid shrimp): MATC >15 ug/l, <27 ug/l

Chronic toxicity (*Daphnia magna*): MATC >52 ug/l, <99 ug/l

OTHER NON-TARGET ORGANISM TOXICITY: Flumioxazin technical is practically non-toxic to bees. The acute contact LC₅₀ in bees was greater than 105 ug/bee.

SECTION 13: DISPOSAL CONSIDERATIONS

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

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

SECTION 14: TRANSPORT INFORMATION

D.O.T. SHIPPING NAME: Compound, weed killing, dry, non-regulated

TECHNICAL SHIPPING NAME: Flumioxazin 51.1% solid

RQ: None

D.O.T. HAZARD CLASS: None

U.N./N.A. NUMBER: None

REMARKS: None

EXEMPTION REQUIREMENT: None

SECTION 15: REGULATORY INFORMATION

REGULATIONS UNDER FIFRA: 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.

OTHER U.S. FEDERAL REGULATIONS:

OSHA: See Section 2

CERCLA RQ*: None

RCRA:** None

SARA TITLE III:

Sara (313) Chemicals: None

Sara (311,312):

Immediate Health Effects: YES

Chronic Health Effects: YES

Fire Hazard: NO

Sudden Release of Pressure: NO

Reactivity Hazard: NO

Sara Section 302: None

This product is not listed as a carcinogen by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), or the Occupational Safety and Health Administration (OSHA).

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.

* RQ: Reportable Quantity

** RCRA waste codes must be determined on a case-by-case basis (i.e., spill, processing waste, etc.).

For information regarding potential adverse health effects from exposure to this product, refer to Sections 3 and 11.

SECTION 16: OTHER INFORMATION

REASON FOR ISSUE: Edit Emergency Overview, deleted "for research and development purposes only" and "to be used only under the direct supervision of a technically qualified individual". This is a commercial product.

REVISION NUMBER: 5

REVISION DATE: 12-18-2002

SUPERSEDES DATE: 04-12-2001

MSDS NUMBER: 0045

THE INFORMATION IN THIS MSDS IS BASED ON DATA AVAILABLE TO US AS OF THE REVISION DATE GIVEN HEREIN, AND BELIEVED TO BE CORRECT. CONTACT VALENT USA CORPORATION TO CONFIRM IF YOU HAVE THE MOST CURRENT MSDS.

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EMERGENCY TELEPHONE #: 1-800-892-0099

NDA - No Data Available

NA - Not Applicable

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