Material Safety Data Sheet

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:	RESOURCE® Herbicide (High Flash Formulation)
VC NUMBER(S):	VC-1097
EPA REGISTRATION NUMBER:	59639-82
SYNONYM(S):	V-23031 Herbicide S-23031 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):
(800) 892-0099
TRANSPORTATION (24 hr.): CHEMTREC
(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.
FLUMICLORAC PENTYL (87546-18-7) [pentyl[2-chloro-4-fluoro-5-(1,3,4,5,6,7-hexahydro-1,3-dioxo-2H-isoindol-2-yl)phenoxy]acetate]	10 – 11	None	---
NAPHTHALENE (91-20-3)	10 - 15	10 ppm TWA 15 ppm STEL	OSHA & ACGIH
2-ETHYLHEXANOL (104-76-7)	<10	None	---
TOTAL HYDROCARBONS (64742-94-5)	75 - 85	100 ppm	Mfgr.
Other**	1 - 10	None	---

* 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

WARNING:
- **CAUSES SUBSTANTIAL BUT TEMPORARY EYE IRRITATION**
- **CAUSES SKIN IRRITATION**
- **HARMFUL IF SWALLOWED OR ABSORBED THROUGH THE SKIN**
- **ASPIRATION HAZARD, DO NOT INDUCE VOMITING**
- **DO NOT GET IN EYES, ON SKIN OR ON CLOTHING**
- **KEEP OUT OF REACH OF CHILDREN**

POTENTIAL HEALTH EFFECTS

Acute Toxicity (Primary Routes of Exposure)

Signs and Symptoms of Systemic Effects: Signs of toxicity in test animals exposed to lethal or near-lethal oral doses included salivation, changes in respiratory rate, decreased activity, lacrimation, abnormal gait, and body tremors. This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of low viscosity

products can cause chemical pneumonitis which can be fatal. Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and, in infants, brain damage.

Eye: This product has been shown to cause prolonged or significant eye irritation. The expected adverse health effects resulting from an exposure may include redness, swelling and pain which could last for an extended period of time.

Skin: This product has been shown to cause prolonged or significant skin irritation. The expected adverse health effects resulting from an exposure may include redness, swelling and pain which could last for an extended period of time.

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 expected adverse systemic health effects are described above.

Ingestion:
This product has been shown to be slightly toxic when ingested. The expected adverse systemic health effects are described above.

Ingestion of this product may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause injury to the lungs and death.

Inhalation: 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.

This product has been shown to be minimally toxic when inhaled. The expected adverse systemic health effects are described above.

Chronic Toxicity (Including Cancer): Studies with Flumiclorac Pentyl Technical indicate that repeated high exposures can produce changes in the liver, kidney and red blood cells but did not produce cancer in test animals.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Symptoms include fatigue, concentration difficulties, anxiety, depression, rapid mood swings and short-term memory loss. The reports are not clear with regard to the types of solvents that may cause these symptoms, and there is controversy among scientists to whether the condition exists or is caused by this type of product. Since many other diseases cause some or all of these conditions, a doctor should be consulted if any appear. Prolonged or repeated dermal exposures may cause drying, scaling and even blistering of the skin.

Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Lesions in the kidneys and thymus, signs of anemia, and reduced spleen weights have been observed in rats and mice chronically exposed via gavage.

Teratology (Birth Defects) Information: No developmental toxicity was produced in animals exposed to Flumiclorac Pentyl Technical, even at doses that were toxic to the pregnant animal. There is limited evidence of fetal and maternal toxicity from exposure to naphthalene.

Reproduction Information: Flumiclorac Pentyl Technical did not produce reproductive toxicity in animal studies.

Potentially Aggravated Condition: Individuals with preexisting diseases of the liver, kidney, red blood cell and central nervous system 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:
- Immediately call a poison control center or doctor.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give **any** liquid to the person.
- 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: Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis. If ingested, probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: 198° F (92° C) **METHOD:** NDA
AUTOIGNITION: NDA
EXTINGUISHING MEDIA: CO_2, dry chemical, foam, water fog.

FLAMMABLE LIMITS (% by volume in air): Lower: NDA Upper: NDA

(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: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85 ^{o} F.

Products of combustion from fires involving this material 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 chlorine 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: Avoid runoff into storm sewers and ditches which lead to waterways. Contain spilled liquids with dry sorbents.
CLEANUP: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then 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.

FOR SPILLS IN WATER:

CONTAINMENT: This material forms an emulsion in water. Stop or reduce contamination of any water. Isolate contaminated water.
CLEANUP: Remove contaminated water for treatment or disposal.

SECTION 7: HANDLING AND STORAGE

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

DO NOT USE OR STORE near flame, sparks or hot surfaces. Use only in well ventilated area. Keep container closed.

DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

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: Appropriate eye protection must be worn when working with this material or serious harm can result. Wear protective eyewear.

RESPIRATION/VENTILATION: This material may be a respiratory irritant and, unless ventilation is adequate, the use of approved respiratory protection is recommended. Use this material only in well ventilated areas.

SKIN PROTECTION: Do not get on skin or clothing. Skin contact should be avoided by wearing protective clothing including chemical resistant gloves, long sleeved shirt, long pants, shoes and socks. Discard clothing and other absorbent materials that may have been drenched or heavily contaminated with this product's concentrate. Do not reuse them

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Medium brown to dark red clear liquid.
ODOR:	Aromatic odor.
MELTING POINT:	NA
BOILING POINT:	NDA
DENSITY:	0.971 g/ml @ 20° C/20° C
SOLUBILITY:	Emulsifies in water
VAPOR PRESSURE:	NA
DISSOCIATION CONSTANT:	NA
OCTANOL/WATER PARTITION COEFFICIENT:	NA
pH:	6.0 (1% emulsion)
VISCOSITY:	@ 25° C: 10.6 centipoise at 30 rpm, 14.1 centipoise at 60 rpm
CORROSION CHARACTERISTICS:	Not corrosive to containers for one year at ambient temperature.

SECTION 10: STABLITY AND REACTIVITY

CHEMICAL STABILITY: Stable.
INCOMPATIBILITY: NDA
IMPACT EXPLODABILITY: Not explosive.
OXIDATION/REDUCTION PROPERTIES: Not reactive

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE (Product Specific Information):

Eye Irritation: This product produced moderate eye irritation in rabbits which cleared within 14 days. (Toxicity Category II)

Skin Irritation: This product produced severe skin irritation in rabbits. (Toxicity Category II)

Dermal Toxicity: The dermal LD_{50} in rabbits is greater than 2 g/kg. (Toxicity Category III)

Oral Toxicity: The oral LD_{50} in rats is 3.2 g/kg for females and 4.1 g/kg for males. (Toxicity Category III)

Inhalation Toxicity: The 4-hour LC_{50} in rats is 5.51 mg/l. (Toxicity Category IV) This product is also expected to be a respiratory irritant.

Skin Sensitization: This product was not a skin sensitizer in a Buehler Guinea Pig Sensitization study. It did produce a positive sensitization response when injected intradermally in a Guinea Pig Maximization test. Results from the Buehler method are considered more relevant to actual exposure scenarios since it uses a topical application. Therefore, this product is not considered a skin sensitizer.

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.

TERATOLOGY/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 F_1 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 OTHER INGREDIENTS:

This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Prolonged or repeated dermal exposures may cause drying, scaling and even blistering of the skin. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Symptoms include fatigue, concentration difficulties, anxiety, depression, rapid mood swings and short-term memory loss. The reports are not clear with regard to the types of solvents that may cause these symptoms, and there is controversy among scientists to whether the condition exists or is caused by this type of product. Since many other diseases cause some or all of these conditions, a doctor should be consulted if any appear.

Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and, in infants, brain damage. There is limited evidence of fetal and maternal toxicity from exposure to naphthalene.

Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Lesions in the kidneys and thymus, signs of anemia, and reduced spleen weights have been observed in rats and mice chronically exposed via gavage.

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

TOXICITY OF FLUMICLORAC PENTYL TECHNICAL:

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

LD_{50} quail: greater than 2250 mg/kg
LC_{50} duck: greater than 5620 ppm
LC_{50} 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 LC_{50} bluegill sunfish: 17.4 mg/l
96-hour LC_{50} rainbow trout: 1.1 mg/l
48-hour LC_{50} Daphnia magna: greater than 38.0 mg/l
96-hour LC_{50} sheepshead minnow: greater than 24 mg/l
96-hour EC_{50} eastern oyster: greater than 1.8 mg/l
96-hour LC_{50} mysid shrimp: 0.56 mg/l

OTHER NON-TARGET ORGANISM TOXICITY: Flumiclorac Pentyl Technical is practically non-toxic to bees. The acute contact LD_{50} is greater than 106 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:	Compounds, weed killing, liquid, non-regulated.
TECHNICAL SHIPPING NAME:	Flumiclorac Pentyl 10.6% Solution
RQ:	102 gal
D.O.T. HAZARD CLASS:	NA
U.N./N.A. NUMBER:	NA
REMARKS:	Marine pollutant when shipped in bulk or non-bulk by water. Regulated when shipped in bulk (greater than RQ).
EXCEPTION REQUIREMENT:	49 CFR 171.4, 49 CFR 173.150

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*: Product RQ = 102 gal; naphthalene RQ = 100 lb
RCRA:** Naphthalene waste code = U165
SARA TITLE III:
Sara (313) Chemicals: naphthalene
Sara (311,312):
Immediate Health Effects: YES
Chronic Health Effects: YES
Fire Hazard: YES
Sudden Release of Pressure: NO
Reactivity Hazard: NO
Sara Section 302: NA

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: Sections 4, 14 and 15 revised**.**
REVISION NUMBER: 3
REVISION DATE: 10/30/2001
SUPERSEDES DATE: 08/21/2000
MSDS NUMBER: 0034

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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