

MATERIAL SAFETY DATA SHEET

Spartan Charge Herbicide



MSDS Ref. No.: F18-73-7-1

Date Approved: 07/23/2008

Revision No.: 1

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Spartan Charge Herbicide
PRODUCT CODE:	6365
ACTIVE INGREDIENT(S):	Carfentrazone-ethyl*; Sulfentrazone**
CHEMICAL FAMILY:	Triazolinones
MOLECULAR FORMULA:	$C_{15}H_{14}N_3O_3F_3Cl_2^*$; $C_{11}H_{10}Cl_2F_2N_4O_3S^{**}$
SYNONYMS:	FMC 116426; F8426; Ethyl 2-chloro-3-[2-chloro-4-fluoro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]phenyl]-propanoate; IUPAC: 2-chloro-3-[2-chloro-5-(4-difluoromethyl-3-methyl-5-oxo-4,5-dihydro-[1,2,4] triazol-1-yl)-4-fluoro-phenyl] propionic acid ethyl ester, or Ethyl 2-chloro-3-[2-chloro-5-(4-difluoromethyl-3-methyl-5-oxo-4,5-dihydro-[1,2,4] triazol-1-yl)-4-fluoro-phenyl] propionate*; FMC 97285; F6285; CAS: N-[2,4-dichloro-5-[4-difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]phenyl]methanesulfonamide; IUPAC: N-[2,4-dichloro-5-(4-difluoromethyl-3-methyl-5-oxo-4,5-dihydro-[1,2,4]triazol-1-yl)phenyl]methane sulfonamide**

MANUFACTURER

FMC CORPORATION
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)
msdsinfo@fmc.com (Email - General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 331-3148 (Medical - U.S.A. & Canada)
(651) 632-6793 (Medical - Collect - All Other Countries)

For leak, fire, spill, or accident emergencies, call:
(800) 424-9300 (CHEMTREC - U.S.A. & Canada)
(703) 527-3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- White liquid with a sweet odor.
- Combustible. May support combustion at elevated temperatures.
- Thermal decomposition and burning may form toxic by-products.
- Slightly combustible. May support combustion at elevated temperatures.
- Highly toxic to algae and toxic to fish and aquatic organisms. Keep out of drains and water courses.

POTENTIAL HEALTH EFFECTS: Effects from overexposure may result from swallowing, breathing or coming into contact with the skin or eyes. Symptoms of overexposure include pinpoint pupils, muscular incoordination, labored breathing, tearing, and diarrhea.

MEDICAL CONDITIONS AGGRAVATED: Persons with pre-existing eye or skin conditions may be more sensitive to glycerin.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Carfentrazone-ethyl	128639-02-1	3.53	None	N; R50/53
Sulfentrazone	122836-35-5	31.77	None	Not classified
Xanthan gum	11138-66-2	<9	234-394-2	Not classified
Glycerin	56-81-5	<8	200-289-5	Not classified
Aromatic Hydrocarbons	64742-94-5	<3.5	265-198-5	Xn; R65
Propylene Glycol	57-55-6	<3	200-338-0	Not classified
Surfactant Blend		<3	None	Not classified
Toluene	108-88-3	<1.2	203-625-9	F - Xn; R11-38-48/20-63-65-67
Naphthalene	91-20-3	<1	202-049-5	Xn-N; R22-40-50/53

4. FIRST AID MEASURES

EYES: Flush with water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Do not induce vomiting and do not give liquids of any kind to the person. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: This product has low oral, dermal and inhalation toxicity. It is minimally irritating to the eyes and slightly irritating to the skin. It is non-sensitizing to the skin. This product contains aromatic hydrocarbons that can produce severe pneumonitis if aspirated during vomiting. Consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Foam, CO₂ or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

FIRE / EXPLOSION HAZARDS: Combustible. May support combustion at elevated temperatures.

FIRE FIGHTING PROCEDURES: Isolate fire area. Evacuate downwind. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke, gases or vapors generated.

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Isolate and post spill area. Remove nearby ignition sources (such as smoking, matches or open flames). Wear protective clothing and respiratory protection as prescribed in Section 8, "Exposure Controls/Personal Protection" below. Keep unprotected persons and animals out of the area.

Keep material out of lakes, streams, ponds and sewer drains. Dike to confine spill and absorb with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump waste into a drum and label contents for disposal.

To clean and neutralize spill area, tools and equipment, wash with a suitable solution of caustic or soda ash, and an appropriate alcohol (i.e., methanol, ethanol or isopropanol). Follow this by washing with a strong

soap and water solution. Absorb, as above, any excess liquid and add to the drums of waste already collected. Repeat if necessary. Dispose of drummed waste according to the method outlined in Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

HANDLING AND STORAGE: Store in a cool, dry, well-ventilated place. Do not use or store near heat, open flame or hot surfaces. Store in original containers only. Keep out of reach of children and animals. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Xanthan gum		15 mg/m ³ (8-hour TWA) (total dust) 5 mg/m ³ (8-hour TWA) (respirable)	
Glycerin	10 mg/m ³	15 mg/m ³ (total dust)	
Aromatic Hydrocarbons			18 ppm
Toluene	50 ppm (TWA) (skin)	200 ppm (PEL) 300 ppm (STEL)	
Naphthalene	10 ppm (TWA) 15 ppm (STEL)	10 ppm (TWA) 50 mg/m ³ (TWA) 15 ppm (STEL)	

ENGINEERING CONTROLS: Use local exhaust at all process locations where vapor or mist may be emitted. Ventilate all transport vehicles prior to unloading.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: For splash, mist or spray exposure, wear chemical protective goggles or a face shield.

RESPIRATORY: For splash, mist or spray exposures wear, as a minimum, a properly fitted half-face or full-face air-purifying respirator which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization). Respirator use and selection must be based on airborne concentrations.

PROTECTIVE CLOTHING: Depending upon concentrations encountered, wear coveralls or long-sleeved uniform and head covering. For larger exposures as in the case of spills, wear full body cover barrier suit, such as a PVC suit. Leather items - such as shoes, belts and watchbands - that become contaminated should be removed and destroyed. Launder all work clothing before reuse (separately from household laundry).

GLOVES: Wear chemical protective gloves made of materials such as nitrile or neoprene. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

WORK HYGIENIC PRACTICES: Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum, or using tobacco. Shower at the end of the workday.

COMMENTS:

Personal protective recommendations for mixing or applying this product are prescribed on the product label. Information stated above provides useful, additional guidance for individuals whose use or handling of this product is not guided by the product label.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Sweet
APPEARANCE:	White liquid
DENSITY / WEIGHT PER VOLUME:	3.5 lbs/gal (423.6 g/L)
FLASH POINT:	> 91 °C (> 196 °F)
MOLECULAR WEIGHT:	412.2 (carfentrazone-ethyl) 387.19 (sulfentrazone)
pH:	4.4 (1% solution)
SOLUBILITY IN WATER:	Dispersible
SPECIFIC GRAVITY:	1.2 g/mL at 20°C

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Excessive heat and fire.
STABILITY:	Stable
POLYMERIZATION:	Will not occur
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, and hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Minimally irritating (rabbit)

SKIN EFFECTS: Slightly irritating (rabbit)

DERMAL LD₅₀: > 5,050 mg/kg (rat)

ORAL LD₅₀: 5,000 mg/kg (rat)

INHALATION LC₅₀: > 2.27 mg/l (4 h) (rat) Maximum attainable concentration - zero mortality

SENSITIZATION: (Skin) Non-sensitizing (guinea pig)

ACUTE EFFECTS FROM OVEREXPOSURE: This product has low oral, dermal and inhalation toxicity. It is minimally irritating to the eyes and slightly irritating to the skin. It is non-sensitizing to the skin. Signs of toxicity in laboratory animals included erythema, desquamation, eschar formation, alopecia and piloerection.

Prolonged contact with dry xanthan gum powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration; due to the hygroscopic properties of the gums, they can form a paste or gel in the airway.

Glycerin is nontoxic after ingestion, except with very large doses, when it can cause headache, dizziness, nausea, vomiting, thirst, diarrhea and confusion. Glycerin had no systemic effects in humans after skin application. If it comes in direct contact with the eye, glycerin can cause stinging, burning sensations, tearing, and redness, but no injury. Severe dehydration, cardiac arrhythmias, and hyperosmolar nonketotic coma have been reported and may be fatal.

Inhalation of aromatic hydrocarbon and toluene vapors may cause dizziness, disturbances in vision, drowsiness, respiratory irritation, and eye, skin and mucous membrane irritation. Vomiting after ingestion of this product may cause aspiration of aromatic hydrocarbons and toluene vapors into the lungs, which may result in fatal pulmonary edema.

In humans, ingestion of large amounts of propylene glycol has resulted in symptoms of reversible central nervous system depression including stupor, rapid breathing and heartbeat, profuse sweating and seizures.

Effects observed in laboratory animals after acute inhalation of toluene included mucous membrane irritation, motor incoordination, prostration, changes in respiratory rate, changes in serum and blood enzyme activities, elevated blood glucose and packed cell volume, decreased body weight and death.

Naphthalene, if ingested, may cause red blood cell hemolysis, especially in individuals with glucose-6-phosphate dehydrogenase deficiency.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the formulation. In studies with laboratory animals, carfentrazone-ethyl did not cause reproductive toxicity, teratogenicity, or carcinogenicity. An overall absence of genotoxicity has been demonstrated in tests of mutagenicity, DNA damage and chromosome aberrations.

Sulfentrazone was not carcinogenic in lifetime feeding studies with laboratory animals, nor was it found to be mutagenic in a battery of tests. In a reproduction study, sulfentrazone produced adverse effects on the

growth and survival of the offspring, decreased male fertility and oligospermia at 25 mg/kg/day, and 35 mg/kg/day. Sulfentrazone was found to be fetotoxic in oral and dermal developmental toxicity studies; the fetal NOELS were 10 mg/kg/day and 100 mg/kg/day, respectively. At labeled use rates and practices of mixing and applying, expected exposure to farm workers is at least one hundred times lower than the doses that produced effects in laboratory animals.

Long-term feeding studies, with xanthan gum, showed no adverse effects up to 1,000 mg/kg/day in rats and dogs. In a 3-generation reproduction study, there were no adverse effects at up to 500 mg/kg/day in rats.

When given to rats at a concentration of 5% in the drinking water for six months, glycerin caused calcification in the renal tubules. In another rat drinking water study, it increased urinary levels of oxalic acid. Glycerin was not mutagenic in the Ames Salmonella microsome assay. Glycerin was reported to induce chromosome aberrations in rat bone marrow and sperm cells, but an occupational cytogenetics study found no significant increase in chromosome aberrations. Glycerin did not cause birth defects in mice or rabbits. It is metabolized more rapidly in pregnant rats, than it is in non-pregnant rats. It was transferred to the rat fetus, but not appreciably to the mouse fetus. Rats given high levels of glycerin in the diet (30-60%) had slower reproduction, but this was probably because of caloric imbalance rather than a specific effect of glycerin. Glycerin suppressed sperm production in rats when injected directly into the testes. When given orally to male rats at a dose of 100 mg/kg, it had no effect on fertility.

Chronic exposure to aromatic hydrocarbon and toluene vapors may cause headaches, dizziness, loss of sensations or feelings, and liver and kidney damage. Inhalation of aromatic hydrocarbon and toluene vapors at high doses has also resulted in an increase incidence of malformations and decreases in fetal weight in laboratory animals.

Repeated overexposure to propylene glycol can produce central nervous system depression, hemolysis and minimal kidney damage.

Naphthalene causes cataracts in humans, rats, rabbits and mice. In 2-year inhalation studies conducted by the National Toxicology Program (NTP), there was no evidence of carcinogenic activity of naphthalene in male mice, there was some evidence of carcinogenic activity in female mice and there was clear evidence of carcinogenic activity in male and female rats. Inhalation studies conducted by the International Agency for Research on Cancer (IARC) have found that there is inadequate evidence of carcinogenicity in humans, therefore, IARC has classified naphthalene as a Group 2B (possibly carcinogenic to humans); however, IARC has found that there is sufficient evidence of carcinogenicity in experimental animals.

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Naphthalene	2B	Anticipated Carcinogen	Not listed	(ACGIH) Not listed

12. ECOLOGICAL INFORMATION

No data available for the formulation. Data presented below are based on the active ingredients.

ENVIRONMENTAL DATA: Carfentrazone-ethyl is rapidly degraded in soil (DT50 < 1.5 days) through microbial degradation, initially by hydrolysis to F8426-chloropropionic acid, and then through further side-chain degradation to other acids. Based on field studies, carfentrazone-ethyl and its major metabolite, F8426-chloropropionic acid, are confined to the top soil layer, indicating only slight mobility in soil. Carfentrazone-ethyl is hydrolytically unstable in base (half-life of 5.1 hours), with stability increasing with decreasing pH. It is susceptible to photolytic degradation in water, with a half-life of 8.3 days (pH 5). The Log Pow is 3.36 and the measured bioconcentration factor in whole fish is 159, both

indicating a low potential for accumulation. Its vapor pressure is 1.19×10^{-7} torr, indicating that volatility is not a concern with this chemical.

Sulfentrazone is stable in soil (half-life = 18 months). In water, sulfentrazone is stable to hydrolysis over the pH range of 5 to 9; however, it will readily undergo photolysis (half-life < 0.5 day). Sulfentrazone has a low affinity for organic matter ($K_{oc} = 43$), but is mobile only in soils with high sand content. The potential for sulfentrazone to bioaccumulate is very low, having a Log Pow of 1.48, and a bioconcentration factor of 1.1 - 2.0.

ECOTOXICOLOGICAL INFORMATION: Carfentrazone-ethyl is very toxic to algae (EC50: 5.7 to 17 $\mu\text{g/L}$), and much less toxic to fish (LC50: 1.6 to 2.0 mg/L), and aquatic crustacea (LC50 > 9.8 mg/L). Care should be taken to avoid contamination of the aquatic environment. In a test with earthworms, carfentrazone-ethyl was shown to cause no effects at concentrations up to 820 mg/kg in soil. Carfentrazone-ethyl shows little toxicity to birds either orally (LD50 > 2,250 mg/kg), or in the diet (LC50 > 5,620 ppm). Similarly, carfentrazone-ethyl has low toxicity to bees (no death at 200 $\mu\text{g/bee}$).

Sulfentrazone is slightly toxic to fish and aquatic arthropods, with LC₅₀ values ranging from 60.4 mg/L to > 130 mg/L. Sulfentrazone has a very low order of toxicity to waterfowl (dietary LC₅₀ > 5620 ppm) and upland game birds (oral LD₅₀ > 2,250 mg/kg).

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be disposed of by use according to label instructions, an acceptable method of disposal is to incinerate in accordance with local, state and national environmental laws, rules, standards and regulations. However, because acceptable methods of disposal may vary by location and regulatory requirements may change, the appropriate agencies should be contacted prior to disposal.

EMPTY CONTAINER: Non-returnable containers that held this material should be cleaned, prior to disposal, by triple rinsing. Containers which held this material may be cleaned by being triple-rinsed, and recycled, with the rinsate being incinerated. Do not cut or weld metal containers. Vapors that form may create an explosion hazard.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PACKAGING TYPE:	Non-Bulk
ADDITIONAL INFORMATION:	This material is not a hazardous material as defined by US Department of Transportation at 49 CFR Parts 100 through 185.
PACKAGING TYPE:	Bulk

ADDITIONAL INFORMATION:

This product is not subject to the Hazardous Materials Regulations.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)**PACKAGING TYPE:**

Non-Bulk

ADDITIONAL INFORMATION:

This product is not subject to the IMDG Code.

ADR - EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD**PACKAGING TYPE:**

Non-Bulk

PROPER SHIPPING NAME:

Environmentally hazardous substance, liquid, n.o.s.

TECHNICAL NAME(S):

Carfentrazone-ethyl

PRIMARY HAZARD CLASS / DIVISION:

9

CLASSIFICATION CODE:

M6

UN/NA NUMBER:

UN3082

PACKING GROUP:

III

HAZARD IDENTIFICATION NUMBER:

90

MARINE POLLUTANT:

Carfentrazone-ethyl

LABEL(S):

9

PLACARD(S):

9

MARKING(S):

UN3082 + Marine Pollutant

ADDITIONAL INFORMATION:

Carfentrazone-ethyl is highly toxic to algae.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)**PACKAGING TYPE:**

Non-Bulk

PROPER SHIPPING NAME:

Environmentally hazardous substance, liquid, n.o.s.

TECHNICAL NAME(S):

Carfentrazone-ethyl

PRIMARY HAZARD CLASS / DIVISION:

9

UN/NA NUMBER:	UN3082
PACKING GROUP:	III
LABEL(S):	9
LIMITED QUANTITY:	Y914 / 30 kg G
LIMITED QUANTITY: PASSENGER / CARGO:	914 / 450 L
LIMITED QUANTITY: CARGO:	914 / 450 L
ADDITIONAL INFORMATION:	Carfentrazone-ethyl is toxic to algae and is considered a Marine Pollutant under ADR. Air shipments from, to, or within ADR member countries are shown. Shipments to, from, or with the USA, and those countries not regulating "toxic to algae as a Marine Pollutant" are not regulated. Marks: Environmentally hazardous substance, liquid, n.o.s. (carfentrazone-ethyl), UN3082 + Marine Pollutant Marine Pollutant: Carfentrazone-ethyl

OTHER INFORMATION:

Toxic to algae is a classification criterion applicable for shipments within ADR countries (Europe), and does not apply under US DOT (49 CFR) nor the IMDG Code (MARPOL). It is allowed under IATA if required by the Competent Authority of the country(ies) involved.

HARMONIZED SYSTEM

Import to the U.S.A.: 3808.93.1500

Export from the U.S.A.: 3808.93.0000

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):**

Not listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):

Immediate, Delayed, Fire

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):

The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):

This product contains the following ingredients subject to Section 313 reporting requirements:

Toluene, Naphthalene

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)**CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):**

Listed

<u>Chemical Name</u>	<u>RQ</u>
Toluene	1,000 lb
Naphthalene	100 lb

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT

U.S. EPA Signal Word: CAUTION

CANADA**WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Hazard Classification / Division: D2A
D2B

INTERNATIONAL LISTINGS

Australian Hazard Code: 3Z

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols:	F	(Highly Flammable)
	Xn	(Harmful)
	N	(Dangerous for the environment)
EC Risk Phrases:	R11	(Highly flammable)
	R22	(Harmful if swallowed.)
	R38	(Irritating to skin)
	R40	(Possible risks of irreversible effects.)
	R48/20	(Harmful: danger of serious damage to health by prolonged exposure through inhalation)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
	R63	(Possible risk of harm to the unborn child)
	R65	(Harmful: may cause lung damage if swallowed.)
	R67	(Vapors may cause drowsiness and dizziness.)

16. OTHER INFORMATION

REVISION SUMMARY:

New MSDS.

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