

MATERIAL SAFETY DATA SHEET

CARFENTRAZONE-ETHYL + 2,4-D WG HERBICIDE



MSDS Ref. No.: F18-05-3
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Revision No.: 2

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the EC directive, 2001/58/EC and other regulatory requirements. The information contained herein is for the concentrate as packaged, unless otherwise noted.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	CARFENTRAZONE-ETHYL + 2,4-D WG HERBICIDE
PRODUCT CODE:	6053
ACTIVE INGREDIENT(S):	Carfentrazone-ethyl*; 2,4-D Sodium Salt**
CHEMICAL FAMILY:	*Triazolinone; **Phenoxy Herbicide
MOLECULAR FORMULA:	C ₁₅ H ₁₄ N ₃ O ₃ F ₃ Cl ₂ (carfentrazone-ethyl); C ₈ H ₆ Cl ₂ O ₃ (2,4-D Sodium Salt)
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*; 2,4-Dichlorophenoxy acetic acid**

Information for Carfentrazone-ethyl*; Information for 2,4-D Sodium Salt**

MANUFACTURER

FMC CORPORATION
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103
(215) 299 6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.A. & Canada)
(202) 483-7616 (CHEMTREC - All Other Countries)
(800) 331-3148 (FMC - U.S.A. & Canada)
(716) 735-3765 (Reverse charges - FMC)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Freeflowing, light grey granules with a phenoxy odor.
- Slightly combustible. May support combustion at elevated temperatures.
- May react violently with strong oxidizing agents.
- Thermal decomposition and burning may form toxic by-products.
- For large exposures or fire, wear personal protective equipment.
- Highly toxic to algae and toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Moderately irritating to the skin and eyes. (see 'Skin Effects' in Section 11, "Toxicological Information", below)

POTENTIAL HEALTH EFFECTS: Effects from overexposure may result from ingestion or coming into contact with the skin or eyes. Symptoms of overexposure include lethargy and decreased and labored respiration.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Carfentrazone-ethyl	128639-02-1	6.48	None	R50/53; S60-61
2,4-D Sodium Salt	2702-72-9	<64.2	220-290-4	Not Classified
Silica, amorphous	7631-86-9	<4.32	231-545-4	Not classified
Kaolin	1332-58-7	<7	None	Not classified
Surfactant Blend		<5	None	Not classified

4. FIRST AID MEASURES

EYES: Flush with water for at least 15 minutes. If irritation occurs and persists, contact a medical doctor.

SKIN: Remove contaminated clothing and thoroughly wash with soap and water. If irritation occurs and persists, contact a medical doctor.

INGESTION: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. If any discomfort persists, obtain medical attention.

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 moderately irritating to the skin and eyes. 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: Slightly combustible. This material 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. Wear protective clothing and personal protective equipment as prescribed in Section 8, "Exposure Controls/Personal Protection". Keep unprotected persons and animals out of the area.

Keep material out of lakes, streams, ponds and sewer drains. Large spills should be covered to prevent dispersal. For dry material, use a wet sweeping compound or water to prevent the formation of dust. If water is used, prevent runoff or dispersion of excess liquid by diking and absorbing with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump all waste material, including absorbent, into a drum and label contents for disposal.

If spilled in soil, remove visibly contaminated soil and replace with clean fill. To clean and neutralize spill area, tools and equipment, wash area 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. Do not store near strong oxidizers. 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
Silica, amorphous		0.1 mg/m ³ (PEL)	
Kaolin		10.0 mg/m ³ (PEL) (total) 5.0 mg/m ³ (STEL) (respirable)	

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

PERSONAL PROTECTIVE EQUIPMENT

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

RESPIRATORY: For dust exposure 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 or using tobacco. Shower at the end of the workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Phenoxy odor
APPEARANCE:	Free-flowing, light-grey granules
DENSITY / WEIGHT PER VOLUME:	0.56 g/mL (tapped)
MOLECULAR WEIGHT:	412.2 (carfentrazone-ethyl)
pH:	6.27 @ 25°C (1% aqueous dispersion)

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Moderately irritating (rabbit)

SKIN EFFECTS: Moderately irritating (rabbit) (Skin Effects: the test material may be classified as a moderate irritant according to the Draize classification scheme; however, it did not meet the criteria for classification as irritant according to the EU Labeling regulations.)

DERMAL LD₅₀: > 2,000 mg/kg (rat)

ORAL LD₅₀: 899 mg/kg (rat)

INHALATION LC₅₀: > 5.24 mg/l (4 h) (rat) Zero mortality

SENSITIZATION: This product is not a skin sensitizer.

ACUTE EFFECTS FROM OVEREXPOSURE: This product has low oral, dermal and inhalation toxicity. It is moderately irritating to the skin and eyes. Signs of toxicity in laboratory animals included hunched posture, ataxia, pilo-erection, lethargy, decreased respiratory rate, chromodacryorrhea, ptosis, tremors and tonic convulsions. Large doses of 2,4-D in humans have caused severe metabolic acidosis, symptoms of damage to striated muscle, acute renal failure, changes to heart and nervous system function, coma and death. Exposure of laboratory animals to large doses of 2,4-D has caused vomiting, diarrhea, anorexia, weight loss, and ulcers of the mouth and pharynx.

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. In studies with laboratory animals, chronic exposure to 2,4-D caused damage to the liver, kidneys and nervous system, with possible damage to striated muscle and the brain. Equivocal evidence exists indicating 2,4-D exposure may cause teratogenic and mutagenic effects in laboratory specimens.

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 ($DT_{50} < 1.5$ 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. 2,4-D is expected to readily biodegrade in soils (reported half-life ranges from <1 day to several weeks). Its adsorption to soil will likely depend on the amount of organic matter present and the pH of the soil ($pK_a = 2.64$). Migration to groundwater may occur in course, sandy soils, and is enhanced at high pH. Degradation in water is expected to occur rapidly, with reported half-life values from 10 to >50 days. In aquatic sediments, the reported half-life is <1 day. 2,4-D is not expected to bioconcentrate in aquatic organisms.

ECOTOXICOLOGICAL INFORMATION: Carfentrazone-ethyl is very toxic to algae (EC_{50} : 5.7 to 17 $\mu\text{g/L}$), and much less toxic to fish (LC_{50} : 1.6 to 2.0 mg/L), and aquatic crustacea ($LC_{50} > 9.8$ 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 ($LD_{50} > 2,250$ mg/kg), or in the diet ($LC_{50} > 5,620$ ppm). Similarly, carfentrazone-ethyl has low toxicity to bees (no death at 200 $\mu\text{g/bee}$). 2,4-D is expected to be more toxic at lower pH. It is slightly toxic to fish (LC_{50} : 35 to 72 mg/L), practically non-toxic to *Daphnia magna* (LC_{50} : 363 to 389 mg/L/48-hour), practically non-toxic to deer (oral LD_{50} : 400 to 800 mg/kg), and practically non-toxic to birds (oral LD_{50} : 200 to >842 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: Completely empty package into application equipment. Then dispose of empty package in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S):	2,4-D sodium salt
PRIMARY HAZARD CLASS / DIVISION:	9
UN/NA NUMBER:	UN 3077
PACKING GROUP:	III
LABEL(S):	9
PLACARD(S):	9
MARKING(S):	RQ Environmentally hazardous substance, liquid, n.o.s. (2,4-D sodium salt), UN3077
REPORTABLE QUANTITY (RQ):	2,4-D sodium salt
ADDITIONAL INFORMATION:	When in packages containing less than 155 pounds, this material is not a hazardous material as defined by U.S. Department of Transportation at 49 CFR Parts 100 through 185. 2,4-D sodium salt is in an "RQ" quantity when this material meets or exceeds 155 pounds per package.
PACKAGING TYPE:	Bulk
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S):	2,4-D sodium salt
PRIMARY HAZARD CLASS / DIVISION:	9
UN/NA NUMBER:	UN 3077
PACKING GROUP:	III
LABEL(S):	9
PLACARD(S):	9

MARKING(S): 3077
REPORTABLE QUANTITY (RQ): 2,4-D sodium salt

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PACKAGING TYPE: Non-Bulk
PROPER SHIPPING NAME: Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S): 2,4-D sodium salt
PRIMARY HAZARD CLASS / DIVISION: 9
UN/NA NUMBER: UN 3077
PACKING GROUP: III
LABEL(S): 9
PLACARD(S): 9
MARKING(S): RQ Environmentally hazardous substance, liquid, n.o.s. (2,4-D sodium salt), UN3077
REPORTABLE QUANTITY (RQ): 2,4-D sodium salt
ADDITIONAL INFORMATION: EmS Number: F-A, S-F
 When in packages containing less than 155 pounds, this material is not a dangerous good as defined by the International Maritime Dangerous Goods Code. 2,4-D sodium salt is in an "RQ" quantity when this material meets or exceeds 155 pounds per package.

ADR - EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD

PACKAGING TYPE: Non-Bulk
PROPER SHIPPING NAME: Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S): Carfentrazone-ethyl
PRIMARY HAZARD CLASS / DIVISION: 9
CLASSIFICATION CODE: M7
UN/NA NUMBER: UN3077
HAZARD IDENTIFICATION NUMBER: 90
MARINE POLLUTANT: Carfentrazone-ethyl
LABEL(S): 9

PLACARD(S): 9
MARKING(S): UN 3077 + Marine Pollutant

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

PACKAGING TYPE: Non-Bulk
PROPER SHIPPING NAME: Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S): 2,4-D sodium salt
PRIMARY HAZARD CLASS / DIVISION: 9
UN/NA NUMBER: UN3077
PACKING GROUP: III
LABEL(S): 9
LIMITED QUANTITY: Y911 / 30 kg
LIMITED QUANTITY: PASSENGER / CARGO: 911 / No limit
LIMITED QUANTITY: CARGO: 911 / No limit
ADDITIONAL INFORMATION: When in packages containing less than 155 pounds, this material is not a dangerous good as defined in ICAO and the International Air Transport Association Dangerous Goods Regulations. 2,4-D sodium salt is in an "RQ" quantity when this material meets or exceeds 155 pounds per package.
Marks: RQ Environmentally hazardous substance, liquid, n.o.s. (2,4-D sodium salt), UN3077
RQ: 2,4-D sodium salt

OTHER INFORMATION:

HARMONIZED SYSTEM
Import to the U.S.A.: 3808.30.1500
Export from the U.S.A.: 3808.30.0000

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

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:

2,4-D sodium salt

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):

Not listed

INTERNATIONAL LISTINGS

Australian Hazard Code: 3XE

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:

Carfentrazone-ethyl, (Index #607-309-00-5):

EC Symbols:	N	(Dangerous for the environment)
EC Risk Phrases:	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
EC Safety Phrases:	S60	(This material and its container must be disposed of as hazardous waste)
	S61	(Avoid release to the environment. Refer to special instructions/safety data sheets.)

COMMENTS:

FAO / WHO Classification: Not Classified

16. OTHER INFORMATION

REVISION SUMMARY:

This MSDS replaces Revision #1, dated April 14, 2000.

Changes in information are as follows:

New Format, as well as:

Section 14 (Transport Information)

Section 15 (Regulatory Information)

Section 16 (Other Information)

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