MATERIAL SAFETY DATA SHEET

SHARK® HERBICIDE

MSDS Ref. No.: 128639-02-1-8
Date Approved: 01/12/2006
Revision No.: 7

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:	SHARK® HERBICIDE
PRODUCT CODE:	6017
ACTIVE INGREDIENT(S):	Carfentrazone-ethyl
CHEMICAL FAMILY:	Triazolinone
MOLECULAR FORMULA:	$C_{15}H_{14}N_3O_3F_3Cl_2$ (carfentrazone-ethyl)
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
ALTERNATE PRODUCT NAME(S):	Shark® H2O

MANUFACTURER

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

EMERGENCY TELEPHONE NUMBERS

(800) 331-3148 (FMC - U.S.A. & Canada)
(716) 735-3765 (FMC - Reverse charges)

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

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Light- to dark-brown solid, with a slight musty odor.
- Slightly combustible. May support combustion at elevated temperatures. Finely dispersed particles can form explosive mixtures in air.

- 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.

POTENTIAL HEALTH EFFECTS: Effects from overexposure may result from inhaling or coming into contact with the skin. Symptoms of overexposure include shaking and tearing of the eyes.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Carfentrazone-ethyl	128639-02-1	40	None	R50/53; S60-61
Silica, Amorphous	112926-00-8	<29.1	None	Not classified
Lignosulfonate acid, sodium salt	8061-51-6	<12	None	Not classified
Alkyl polyglycoside	68515-73-1	<1.2	None	Not classified
Silica, quartz	14808-60-7	<0.3	238-878-4	Not classified

4. FIRST AID MEASURES

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

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 minimally irritating to the eyes. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Foam, CO_2 or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

FIRE / EXPLOSION HAZARDS: Slightly combustible. May support combustion at elevated temperatures. Finely dispersed particles can form explosive mixtures in air.

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.

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
Silica, Amorphous	10 mg/m^3 (TWA)	20 mg/m^3 (STEL)	
Lignosulfonate acid, sodium salt	5 mg/m^3 (TWA) (respirable)	15 mg/m^3 (PEL) (total)	
Silica, quartz	0.05 mg/m^3 (TWA) (respirable fraction)	0.1 mg/m^3 (PEL) (respirable dust)	

ENGINEERING CONTROLS: No open flames. Prevent deposition of dust; use closed system, consider use of dust explosion-proof electrical equipment and lighting. 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 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Slightly musty
APPEARANCE:	Light- to dark-brown solid
DENSITY / WEIGHT PER VOLUME:	30.56 lb/cu ft @ 22°C (0.49 g/cc)
MOLECULAR WEIGHT:	412.2 (carfentrazone-ethyl)
pH:	7.5 @ 22°C (5.44% in water)

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

SKIN EFFECTS: Moderately irritating

DERMAL LD_{50}: < 5,000 mg/kg (rat)

ORAL LD_{50}: > 5,000 mg/kg (rat)

INHALATION LC_{50}: > 5.72 mg/l (4 h) (rat) Maximum attainable concentration - zero mortality

ACUTE EFFECTS FROM OVEREXPOSURE: This product has low oral, dermal and inhalation toxicity. It is moderately irritating to the skin and minimally irritating to the eyes. Signs of toxicity in laboratory animals included oral discharge, nasal discharge, diarrhea, decreased locomotion and dyspnea.

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. Repeated overexposure to crystalline silica for extended periods has caused acute silicosis. The International Agency for Research on Cancer (IARC) has classified crystalline silica, inhaled in the form of quartz or cristobalite from occupational sources, as carcinogenic to humans (Group 1). The National Toxicology Program (NTP) has classified respirable

crystalline silica (quartz, cristobalite and tridymite) as "reasonably anticipated to be carcinogenic". The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that silica quartz is a suspected human carcinogen (A2 - limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans).

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Silica, quartz	Listed	Listed	Not listed	(ACGIH) Listed

12. ECOLOGICAL INFORMATION

Unless otherwise indicated, the data presented below are based on the active ingredient.

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 x 10-7 torr, indicating that volatility is not a concern with this chemical.

ECOTOXICOLOGICAL INFORMATION: Carfentrazone-ethyl is very toxic to algae (EC_{50}: 5.7 to 17 µg/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 µg/bee).

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
ADDITIONAL INFORMATION:	This product is not subject to the Hazardous Materials Regulations.
PACKAGING TYPE:	Bulk
ADDITIONAL INFORMATION:	This product is not subject to the Hazardous Materials Regulations.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

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
TECHNICAL NAME(S):	Carfentrazone-ethyl
PRIMARY HAZARD CLASS / DIVISION:	9
CLASSIFICATION CODE:	M7
UN/NA NUMBER:	UN3077
PACKING GROUP:	III
MARINE POLLUTANT:	Carfentrazone-ethyl
LABEL(S):	Class 9, 9
PLACARD(S):	Class 9, 3077, 9
MARKING(S):	UN 3077 + Marine Pollutant
ADDITIONAL INFORMATION:	NOTES: Carfentrazone-ethyl is a Marine Pollutant based on toxicity to algae.

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

ADDITIONAL INFORMATION: This material is not a dangerous good as defined in ICAO and the International Air Transport Association Dangerous Goods Regulations.

OTHER INFORMATION:

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

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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):
There are no ingredients in this product, which are subject to Section 313 reporting requirements.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Not listed

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT
U.S. EPA Signal Word: CAUTION

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

Chemical Name:	Silica, quartz
Hazard Classification / Division:	D2A
Domestic Substance List:	Listed (all components, except for Carfentrazone-ethyl)

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.)

16. OTHER INFORMATION

REVISION SUMMARY:
This MSDS replaces Revision #6, dated November 01, 2005.
Changes in information are as follows:
Section 1 (Product and Company Identification)
Section 15 (Regulatory Information)
Section 16 (Other Information)

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