MATERIAL SAFETY DATA SHEET

SQUAREONE™ HERBICIDE

MSDS Ref. No.: 100000016246
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This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other regulatory requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	SQUAREONE™ HERBICIDE
PRODUCT CODE:	6516
ACTIVE INGREDIENT(S):	3,7-Dichloroquinoline-8-carboxylic acid*; Carfentrazone-ethyl**
CHEMICAL FAMILY:	Quinolinecarboxylic acid*, Triazolinone**
MOLECULAR FORMULA:	$C_{10}H_5Cl_2NO_2$*; $C_{15}H_{14}N_3O_3F_3Cl_2$**
SYNONYMS:	Quinclorac; 3,7-Dichloro-8-quinolinecarboxylic acid (IUPAC)*; 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**
GENERAL USE:	Herbicide

Information for Quinclorac*; Information for Carfentrazone-ethyl**

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:

- Granular solid
- 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.
- Slightly toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Moderately irritating to the skin.
- Irritating to the eyes.

POTENTIAL HEALTH EFFECTS: Effects from overexposure may result from either swallowing or coming into contact with the skin or eyes.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
3,7-Dichloroquinoline-8-carboxylic acid	84087-01-4	66.05	402-780-1	Xi; R43
Carfentrazone-ethyl	128639-02-1	3.95	None	N; R50/53
Naphthalenesulfonic acid formaldehyde condensate	68425-94-5	10 - 15	Not applicable	Xi; R36/38
Kaolin	1332-58-7	1 - 10	None	Not classified
Sodium methyl oleoyl taurate	137-20-2	1 - 5	205-285-7	Xn-Xi; R22-41
Silica, amorphous	112926-00-8	<5	601-214-2	Not classified
Sodium alkylnaphthalenesulfonate		1 - 3	None	Xi; R36

4. FIRST AID MEASURES

EYES: Flush with large quantities of water for at least 15 minutes, lifting the upper and lower eyelids intermittently. If wearing contact lenses, remove after the first five minutes and continue flushing with water. If irritation occurs and persists, get medical attention.

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

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 a poison control center or doctor. Do not give anything to an unconscious person.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: This product has low oral, dermal and inhalation toxicity. It is slightly irritating to the eyes and moderately irritating to the skin. It is sensitizing to the skin. Treatment is 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
Kaolin	2 mg/m^3 (TWA) (respirable fraction)	15 mg/m^3 (PEL) (total dust) 5 mg/m^3 (PEL) (respirable fraction)	

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 butyl rubber, 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:	Not available
APPEARANCE:	Granular solid
DENSITY / WEIGHT PER VOLUME:	36.53 lb/cu ft.
MOLECULAR WEIGHT:	242.1 (quinclorac); 412.2 (carfentrazone-ethyl)
PERCENT VOLATILE:	Not available
pH:	3.6
SOLUBILITY IN WATER:	Not available

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: Slightly irritating

SKIN EFFECTS: Moderately irritating

DERMAL LD_{50}: > 2,000 mg/kg

ORAL LD_{50}: 3,129 mg/kg

INHALATION LC_{50}: > 2.06 mg/l

SENSITIZATION: Sensitizing

ACUTE EFFECTS FROM OVEREXPOSURE: This product has low oral, dermal and inhalation toxicity. It is slightly irritating to the eyes and moderately irritating to the skin. It is sensitizing to the skin. Signs of toxicity with carfentrazone-ethyl, in laboratory animals, included tremors, abdominal gripping, mucoid anal discharge, bloody oral discharge, hypothermia, squinting eyes, lacrimation, and pink to orange-brown discoloration of urine.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product. 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.

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Silica, amorphous	3	Not listed	Not listed	(ACGIH) Not listed

12. ECOLOGICAL INFORMATION

Unless otherwise indicated, the data presented below are for the active ingredient(s).

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. 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 (pKa = 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 (EC50: 5.7 to 17 µg/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 µg/bee).

Quinclorac
Algae: 72 Hour EC_{50} = 6.53 mg/L
Aquatic Invertebrates: 48 hour EC_{50} (Daphnia) = 29.8 mg/L
Fish: 96 Hour LC_{50} (Rainbow trout) = 100 mg/L

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 material is not regulated in transportation.

PACKAGING TYPE:	Bulk
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S):	Carfentrazone-ethyl
PRIMARY HAZARD CLASS / DIVISION:	9
UN/NA NUMBER:	UN 3077
PACKING GROUP:	III
MARINE POLLUTANT:	Carfentrazone-ethyl

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

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 does not, to our knowledge, contain any toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

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):

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: D2B

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols:	Xn	(Harmful)
	Xi	(Irritant)
	N	(Dangerous for the environment)
EC Risk Phrases:	R22	(Harmful if swallowed.)
	R36	(Irritating to eyes.)
	R36/38	(Irritating to eyes and skin.)
	R41	(Risk of serious damage to eyes.)
	R43	(May cause sensitization by skin contact.)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)

16. OTHER INFORMATION

NFPA

Health	2
Flammability	1
Reactivity	0
Special	None

No special requirements

NFPA (National Fire Protection Association)

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:
New MSDS.

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