

# MATERIAL SAFETY DATA SHEET

## RAGE™ HERBICIDE



MSDS Ref. No.: F18-57-1  
Date Approved: 03/19/2007  
Revision No.: 1

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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; the EC directive, 2001/58/EC and other regulatory requirements. The information contained herein is for the concentrate as packaged, unless otherwise noted.

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## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** RAGE™ HERBICIDE  
**PRODUCT CODE:** 6350  
**ACTIVE INGREDIENT(S):** Carfentrazone-ethyl\*; Glyphosate IPA\*\*  
**CHEMICAL FAMILY:** Triazolinone\*; Glycine derivative\*\*  
**MOLECULAR FORMULA:** C<sub>15</sub>H<sub>14</sub>N<sub>3</sub>O<sub>3</sub>F<sub>3</sub>Cl<sub>2</sub>\*; C<sub>6</sub>H<sub>17</sub>N<sub>2</sub>O<sub>5</sub>P\*\*  
**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\*;  
N-(phosphonomethyl)glycine, compound with 2-propylamine(1:1), glyphosate, isopropylamine salt\*\*

ADDITIONAL SYNONYMS: F4117 EW (formulation)

### 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)

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## 2. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW:

- Off-white liquid with a faint aromatic odor.
- Slightly combustible. May support combustion at elevated temperatures.
- Thermal decomposition and burning may form toxic by-products.
- For large exposures or fire, wear personal protective equipment.
- Highly toxic to fish and aquatic organisms. Keep out of drains and water courses.

**POTENTIAL HEALTH EFFECTS:** Effects from overexposure result from inhalation or coming into contact with the eyes or skin. Symptoms of overexposure include shaking, tearing of the eyes, and low body temperature.

**MEDICAL CONDITIONS AGGRAVATED:** None presently known.

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## 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Carfentrazone-ethyl	128639-02-1	0.4	None	R50/53; S60-61
Glyphosate IPA	38641-94-0	49.7	254-056-8	Not classified
Surfactant Blend		<13	None	Not classified
Aromatic Hydrocarbons	64742-95-6	<4.4	265-199-0	R10-37-51/53-65-66-67; S23-24-43A-57-60-62
Naphthalene	91-20-3	<1	202-049-5	R22-40-50/53; S2-36/37- 46-60-61

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## 4. FIRST AID MEASURES

**EYES:** Flush with plenty of water. Get medical attention if irritation occurs and persists.

**SKIN:** Wash with plenty of 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 mildly irritating to the eyes, and moderately irritating and 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.

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## 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub> 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.

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## 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. 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".

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## 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. STORE ABOVE -12°C (10°F) TO KEEP FROM CRYSTALLIZING. Crystals will settle to the bottom. If

crystals form, allow product to warm above 10°C (50°F) and mix well or shake to redissolve. Carefully open containers. After partial use, replace lids and close tightly.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Aromatic Hydrocarbons			18 ppm
Naphthalene	10 ppm (TWA) 15 ppm (STEL)	10 ppm (TWA) 50 mg/m <sup>3</sup> (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.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>ODOR:</b>	Slight aromatic
<b>APPEARANCE:</b>	Off-white liquid
<b>DENSITY / WEIGHT PER VOLUME:</b>	10 lb/gal @ 20°C (68°F)
<b>FLASH POINT:</b>	> 107 °C (> 225 °F)
<b>MOLECULAR WEIGHT:</b>	412.2 (carfentrazone-ethyl); 228.2 (glyphosate)
<b>pH:</b>	4.5
<b>VISCOSITY:</b>	2480 cP at 24.2°C (75.6°F)

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## 10. STABILITY AND REACTIVITY

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

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## 11. TOXICOLOGICAL INFORMATION

**EYE EFFECTS:** Similar product: Mildly irritating (rabbit)

**SKIN EFFECTS:** Similar product: Moderately irritating (rabbit)

**DERMAL LD<sub>50</sub>:** Similar product: > 5,000 mg/kg (rat)

**ORAL LD<sub>50</sub>:** Similar product: > 5,000 mg/kg (rat)

**INHALATION LC<sub>50</sub>:** Similar product: > 2.5 mg/l (4 h) (rat) Maximum attainable concentration - zero mortality

**SENSITIZATION:** Similar product: (Skin) Non-sensitizing (guinea pig)

**ACUTE EFFECTS FROM OVEREXPOSURE:** This product has low oral, dermal and inhalation toxicity. It is mildly irritating to the eyes, and moderately irritating and non-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.

Inhalation of aromatic hydrocarbon 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 into the lungs, which may result in fatal pulmonary edema.

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.

Repeated or long-term exposure to glyphosate in laboratory animals have shown to result in reduced body weight gain and effects on the liver tissues. Overall, glyphosate is not considered to be teratogenic, genotoxic and/or a carcinogen.

Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and 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	Listed	Listed	Not listed	(ACGIH) Not listed

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL DATA:** No data available for the formulation.

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  $1.19 \times 10^{-7}$  torr, indicating that volatility is not a concern with this chemical.

Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days. Reported field half-lives range from 1-174 days. Half-life for glyphosate in ponds is 12 days to 10 weeks. It is strongly absorbed to soil. Thus, even though it is highly soluble in water, field and laboratory studies show that glyphosate does not leach and has a low potential for runoff.

**ECOTOXICOLOGICAL INFORMATION:** No data available for the formulation.

Carfentrazone-ethyl is very toxic to algae (EC<sub>50</sub>: 5.7 to 17 µg/L), and much less toxic to fish (LC<sub>50</sub>: 1.6 to 2.0 mg/L), and aquatic crustacea (LC<sub>50</sub> > 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<sub>50</sub> > 2,250 mg/kg), or in the diet (LC<sub>50</sub> > 5,620 ppm). Similarly, carfentrazone-ethyl has low toxicity to bees (no death at 200 µg/bee).

**Glyphosate:**

Slightly toxic to wild birds. LC<sub>50</sub> (bobwhite quail) > 4500 ppm

Practically non-toxic to fish and may be slightly toxic to aquatic invertebrates.

LC<sub>50</sub> 96-hour (bluegill sunfish) = 120 mg/L

LC<sub>50</sub> 96-hour (harlequin) = 1680 mg/L

LC<sub>50</sub> 96-hour (rainbow trout) = 86 mg/L

LC<sub>50</sub> 96-hour (Atlantic oyster) > 10 mg/L

LC<sub>50</sub> 96-hour (fiddler crab) = 934 mg/L

LC<sub>50</sub> 96-hour (shrimp) = 281 mg/L

LC<sub>50</sub> 48-hour (daphnia) = 780 mg/L

LD<sub>50</sub> (oral & dermal) = >0.1 mg/bee (Non-toxic, honeybee)

LC<sub>50</sub> >5000 ppm (Earthworms)

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## 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.

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## 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 material is not a hazardous material as defined by US Department of Transportation at 49 CFR Parts 100 through 185.

**INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)**

**PACKAGING TYPE:**

Non-Bulk

**ADDITIONAL INFORMATION:**

This material is not a dangerous good as defined by the International Maritime Dangerous Goods Code.

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

**PACKAGING TYPE:**

Non-Bulk

**ADDITIONAL INFORMATION:**

This material is not a dangerous good as defined by ADR.

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

**PACKAGING TYPE:**

Non-Bulk

**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.: 3808.93.1500

Export from the U.S.A.: 3808.93.0000

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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):**

As noted below:

<u>Chemical Name</u>	<u>RQ</u>
Naphthalene	100 lb

**FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT**

U.S. EPA Signal Word: CAUTION

**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.)

Aromatic Hydrocarbons, (Index #649-356-00-4):

EC Symbols:	Xn	(Harmful)
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	T	(Toxic)
EC Risk Phrases:	R10	(Flammable)
	R37	(Irritating to respiratory system.)
	R51/53	(Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
	R65	(Harmful: may cause lung damage if swallowed.)
	R66	(Repeated exposure may cause skin dryness or cracking.)
	R67	(Vapors may cause drowsiness and dizziness.)
EC Safety Phrases:	S23	(Do not breathe gas, fumes, vapor, or spray)
	S24	(Avoid contact with skin.)
	S43A	(In case of fire use sand, earth, chemical powder or foam.)
	S57	(Use appropriate container to avoid environmental contamination.)
	S60	(This material and its container must be disposed of as hazardous waste)
	S62	(If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.)
 <u>Naphthalene, (Index #601-052-00-2):</u>		
EC Symbols:	Xn	(Harmful)
	N	(Dangerous for the environment)
EC Risk Phrases:	R22	(Harmful if swallowed.)
	R40	(Possible risks of irreversible effects.)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
EC Safety Phrases:	S2	(Keep out of the reach of children.)
	S36/37	(Wear suitable protective clothing and gloves.)
	S46	(If swallowed, seek medical advice immediately and show this container or label.)
	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.)

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## 16. OTHER INFORMATION

**REVISION SUMMARY:**  
New MSDS.

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