

MATERIAL SAFETY DATA SHEET

COMMAND® 480 EC HERBICIDE



MSDS Ref. No.: 81777-89-1-12

Date Approved: 12/15/2009

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 information contained herein is for the concentrate as packaged, unless otherwise noted.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: COMMAND® 480 EC HERBICIDE

PRODUCT CODE: 6262; 6269

ACTIVE INGREDIENT(S): Clomazone

CHEMICAL FAMILY: Herbicide

MOLECULAR FORMULA: $C_{12}H_{14}ClNO_2$ (clomazone)

SYNONYMS: FMC 57020; 2-(2-chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone; IUPAC: 2-(2-chlorobenzyl)-4,4-dimethyl-1,2-oxazolidin-3-one; 2-(2-chlorobenzyl)-4,4-dimethylisoxazolidin-3-one

ALTERNATE PRODUCT NAME(S): Command® 48 EC, Command® 4 EC, Gamit® 4 EC, Magister™ 48EC, Centium™ 48EC

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:

- Straw yellow liquid with an aromatic solvent odor.
- Moderately combustible. May support combustion if heated above the product's flash point (see Section 9, "Physical and Chemical Properties" below).
- Thermal decomposition and burning may form toxic by-products.
- For large exposures or fire, wear personal protective equipment.

- Slightly to moderately toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Moderately irritating to the eyes.

POTENTIAL HEALTH EFFECTS: Effects from overexposure result from either swallowing, inhaling or coming into contact with the eyes or skin. Symptoms of overexposure include decreased activity, tearing eyes, bleeding from the nose and incoordination.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Clomazone	81777-89-1	<55	None	Xn - N; R20/22-R50/53
Solvent naphtha (petroleum), light aromatic	64742-95-6	<23	265-199-0	Xn-N; R10-37-51/53-65-66-67
1,2,4-trimethylbenzene	95-63-6	<15	202-436-9	Xn-N; R10-20-36/37/38-51/53
Calcium dodecylbenzene sulfonate	26264-06-2	<5	247-557-8	Xi; R38-41
Cumene	98-82-8	<5	202-704-5	Xn-N; R10-37-51/53-65
Isobutyl alcohol	78-83-1	<1.1	201-148-0	Xi; R10-37/38-41-67
Xylene	1330-20-7	<1	215-535-7	Xn; R10-20/21-38

4. FIRST AID MEASURES

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

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.

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

NOTES TO MEDICAL DOCTOR: This product is expected to have low oral, dermal and inhalation toxicity. It is expected to be moderately irritating to the eyes and slightly irritating to the skin.

Direct contact with eyes may produce corneal damage, especially if not washed out immediately. Contains aromatic hydrocarbons that may produce a 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: Moderately combustible. When heated above the flash point, this material releases vapors which, when mixed with air, can burn or be explosive.

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. 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 tools and equipment, wash with a 20% solution of potassium hydroxide in methanol. Follow by washing with strong soap and rinsing with water, and add both solutions to the drums of waste already collected.

To clean and neutralize spill areas, spray the area with a 20% solution of potassium hydroxide in methanol. Cover the treated area with plastic and let stand for 24 hours. Remove the covering and place in a drum for later disposal. Wash the area, three times, with a strong soap and rinse with water. If spill occurs on a wooden surface, repeat the entire process again. Absorb, as above, any excess liquid and add to the drums of waste already collected. 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
Solvent naphtha (petroleum), light aromatic			18 ppm
1,2,4-trimethylbenzene	25 ppm (TWA)		
Cumene	50 ppm (TWA)	50 ppm (PEL) (skin) 245 mg/m ³ (PEL) (skin)	
Isobutyl alcohol	50 ppm (TWA)		
Xylene	100 ppm (TWA) 150 ppm (STEL)	100 ppm (PEL) 435 mg/m ³ (PEL)	

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 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:	Aromatic solvent
APPEARANCE:	Straw yellow liquid
DENSITY / WEIGHT PER VOLUME:	8.6 lb/gal. (1028 g/L)
FLASH POINT:	49 °C (120 °F) (CC)
MOLECULAR WEIGHT:	239.7 (clomazone)
pH:	5.9 (1% dilution at 21°C)
SOLUBILITY IN WATER:	Emulsifies
SPECIFIC GRAVITY:	1.028 @ 20°C (water = 1)

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Expected to be moderately irritating. (rabbit)

SKIN EFFECTS: Expected to be slightly irritating. (rabbit)

DERMAL LD₅₀: No data available.
Similar product: > 2,000 mg/kg (rabbit)

ORAL LD₅₀: No data available.
Similar product: 1,406 mg/kg (rat)

INHALATION LC₅₀: No data available.
Similar product: 4.47 mg/l (4 h) (rat)

ACUTE EFFECTS FROM OVEREXPOSURE: This product is expected to have low oral, dermal and inhalation toxicity. It is expected to be moderately irritating to the eyes and slightly irritating to the skin. Large dosages of clomazone ingested by laboratory animals produced signs of toxicity including ataxia, decreased activity, oral discharge, lacrimation, bloody tears, and nasal discharge. 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. Ingestion of calcium dodecylbenzene sulfonate may cause irritation of the mouth and stomach. Prolonged contact may cause skin irritation or a drying affect. Exposure to butanol vapors may produce headaches, drowsiness and irritation of the nose and throat. Excessive exposures to butanol liquid or vapors may result in contact dermatitis and irritation of the mucous membranes.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the formulation. In studies with laboratory animals, clomazone did not cause reproductive toxicity, teratogenicity, or carcinogenicity. Liver enlargement and elevated cholesterol levels are often noted in laboratory animals that have ingested large doses of clomazone during their lifespan. An overall absence of genotoxicity has been demonstrated in tests of mutagenicity, DNA damage and chromosome aberrations. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage. Chronic exposure to trimethylbenzenes may cause CNS changes, asthmatic bronchitis and blood dyscrasias. Disturbances in hearing and balance have been reported in workers exposed to butanol vapors. Inhalation of xylene vapors at high doses has also resulted in an increased incidence of malformations and decreases in fetal weight in laboratory animals. Damage from xylene may be potentiated by alcohol.

12. ECOLOGICAL INFORMATION

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

ENVIRONMENTAL DATA: No data available for the formulation.

Clomazone has a moderate rate of degradation in soil (half-life = 24 days), and is stable to hydrolysis over a wide range of pH. The bioconcentration potential for clomazone is low, with a Log Pow of 2.5, and a measured bioconcentration factor (BCF) of 27 - 40. Field studies showed that clomazone does not significantly leach below 15 cm in soil and is, therefore, not expected to enter groundwater.

ECOTOXICOLOGICAL INFORMATION: No data available for the formulation.

Clomazone technical:

Freshwater fish: 96-hour LC50 = 19 mg/L (Rainbow trout) (slightly toxic)

Freshwater fish: 96-hour LC50 = 34 mg/L (Bluegill sunfish) (slightly toxic)

Estuarine invertebrates: 96-hour LC50 = 8.9 mg/L (Pink shrimp) (moderately toxic)

Estuarine fish: LC50 = 6.3 mg/L (Atlantic silverside, moderately toxic) - 41 mg/L (Sheepshead minnow, slightly toxic)

Estuarine invertebrate: LC50 = 0.57 mg/L (Mysid) (highly toxic)

Waterfowl / Upland game birds: Oral LD50 >2510 mg/kg; Dietary LC50 >5620 ppm (low toxicity)

Care should be taken to avoid contamination of the aquatic environment.

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 product has been reclassified from Flammable Liquid to Combustible Liquid in accordance with the provisions at 49 CFR § 173.150(f)(1). As a Combustible Liquid, this material is not subject to the hazardous materials regulations when transported within the USA in non-bulk packages per 49 CFR § 173.150(f)(2).
PACKAGING TYPE:	Bulk
PROPER SHIPPING NAME:	Combustible liquid, n.o.s.
TECHNICAL NAME(S):	Aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	Combustible
UN/NA NUMBER:	NA 1993
PACKING GROUP:	III
MARINE POLLUTANT:	Clomazone
PLACARD(S):	Combustible
MARKING(S):	1993

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Flammable liquid, n.o.s.
TECHNICAL NAME(S):	Aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN 1993
PACKING GROUP:	III
MARINE POLLUTANT:	Clomazone
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	Flammable liquid, n.o.s., (Aromatic hydrocarbons; Clomazone), UN1993 + Marine Pollutant
ADDITIONAL INFORMATION:	EmS Number: F-E, S-E

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

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Flammable liquid, n.o.s.
TECHNICAL NAME(S):	Aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	3
CLASSIFICATION CODE:	F1
UN/NA NUMBER:	UN1993
PACKING GROUP:	III
HAZARD IDENTIFICATION NUMBER:	30
MARINE POLLUTANT:	Clomazone
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	UN1993 + Marine Pollutant

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

PACKAGING TYPE:	Non-Bulk
------------------------	----------

PROPER SHIPPING NAME:	Flammable liquid, n.o.s.
TECHNICAL NAME(S):	Aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN1993
PACKING GROUP:	III
LABEL(S):	3
ADDITIONAL INFORMATION:	Marks: Flammable liquid, n.o.s. (Aromatic hydrocarbons, Clomazone), UN1993 + Marine Pollutant Marine Pollutant: Clomazone When shipped by air within the USA, this product is not regulated as a Marine Pollutant in non-bulk packages and does not require identification as a Marine Pollutant; however, when shipped by air within, to and/or from ADR signatory countries, identification as Marine Pollutant is required.

OTHER INFORMATION:

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:
1,2,4-trimethylbenzene, Xylene (mixed isomers)

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>
Calcium dodecylbenzene sulfonate	1,000 lb
Cumene	5,000 lb
Isobutyl alcohol	5,000 lb
Xylene	100 lb

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT

U.S. EPA Signal Word: WARNING

HAZARD AND RISK PHRASE DESCRIPTIONS:Command 48 EC:

EC Symbols:	Xn	(Harmful)
	N	(Dangerous for the environment)
EC Risk Phrases:	R10	(Flammable)
	R20/22	(Harmful by inhalation and if swallowed.)
	R36/37	(Irritating to eyes and respiratory system.)
	R43	(May cause sensitization by skin contact.)
	R65	(Harmful: may cause lung damage if swallowed.)
	R66	(Repeated exposure may cause skin dryness or cracking.)
	R51/53	(Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
EC Safety Phrases:	S1/2	(Keep locked up and out of reach of children.)
	S62	(If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.)
	S23	(Do not breathe gas, fumes, vapor, or spray)
	S24	(Avoid contact with skin.)
	S37	(Wear suitable gloves.)
	S57	(Use appropriate container to avoid environmental contamination.)

Additional Information:

Sensitizing product. Sensitizing components have not been identified. Follow instructions' use to avoid risk to man and the environment.

16. OTHER INFORMATION**NFPA**

Health	1
Flammability	2
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:

This MSDS replaces Revision #1, dated October 3, 2007.

Section 3 (Composition / Information on Ingredients)

Section 8 (Exposure Controls / Personal Protection)

Section 11 (Toxicological Information)

Section 14 (Transport Information)

Section 15 (Regulatory Information)

Section 16 (Other Information)

Command, Gamit, Magister, Centium and FMC Logo - FMC Trademarks

© 2009 FMC Corporation. All Rights Reserved.

FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be applicable where such product is used in combination with any other materials or in any process. It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC Corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.