

SAFETY DATA SHEET

Marvel™ Herbicide

SDS # : 7206-A

Revision date: 2016-05-26

Format: NA

Version 1.03



1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name Marvel™ Herbicide

Other means of identification

Product Code(s) 7206-A

Synonyms Fomesafen: 5-(2-chloro- α,α,α -trifluoro-p-tolyloxy)-N-mesyl-2-nitrobenzamide;
FLUTHIACET-METHYL: Acetic acid, [[2-chloro-4-fluoro-5-[(tetrahydro-3-oxo-1H,3H-[1,3,4]thiadiazolo [3,4- α] pyridazin-1-ylidene) amino] phenyl] thio]-, methyl ester (CAS); methyl [(2-chloro-4-fluoro-5-[(1E)-3-oxo-5,6,7,8-tetrahydro-1H,3H-[1,3,4]thiadiazolo[3,4-a]pyridazin-1-ylidene]amino) phenyl)sulfanyl]acetate (IUPAC)

Active Ingredient(s) Fomesafen; Fluthiacet-methyl

Chemical Family Imine chemicals; Thiadiazoles

Recommended use of the chemical and restrictions on use

Recommended Use: Herbicide

Restrictions on Use: Use as recommended by the label

Manufacturer Address

FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104
(215) 299-6000 (General Information)
msdsinfo@fmc.com (E-Mail General Information)

Emergency telephone number

Medical Emergencies:
1 800 / 331-3148 (PROSAR - U.S.A. & Canada)
1 651 / 632-6793 (PROSAR - All Other Countries - Collect)
For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Inhalation (Dusts/Mists)

Category 4

Carcinogenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 1

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Danger

Hazard Statements

H332 - Harmful if inhaled
H351 - Suspected of causing cancer
H372 - Causes damage to organs through prolonged or repeated exposure



Precautionary Statements - Prevention

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P281 - Use personal protective equipment as required
P271 - Use only outdoors or in a well-ventilated area
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product

Precautionary Statements - Response

P308 + P313 - If exposed or concerned: Get medical advice/attention
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

Precautionary Statements - Storage

P405 - Store locked up

Precautionary Statements - Disposal

P501 - Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

Very toxic to aquatic life with long lasting effects. May be harmful in contact with skin. May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Family Imine chemicals; Thiadiazoles.

Chemical name	CAS-No	Weight %
Fluthiacet-methyl	117337-19-6	1.2
Fomesafen	72178-02-0	30.08
Propylene glycol	57-55-6	5-10
n-Butanol	71-36-3	1-5

Synonyms are provided in Section 1.

4. FIRST AID MEASURES

Eye Contact	Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
Skin Contact	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
Inhalation	Move to fresh air. If person is not breathing, call 911 (within the U.S. and Canada) or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
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 by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	Slight irritation.
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Foam. Carbon dioxide (CO ₂). Dry chemical. Water spray or fog.
Specific Hazards Arising from the Chemical	
<u>Explosion data</u>	
Sensitivity to Mechanical Impact	Not sensitive.
Sensitivity to Static Discharge	Not sensitive.
Protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus and full protective gear. Isolate fire area. Evaluate downwind.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see section 8.
Other	For further clean-up instructions, call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
Environmental Precautions	See Section 12 for additional Ecological Information.
Methods for Containment	Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
Methods for cleaning up	Clean and neutralize spill area, tools and equipment by washing with bleach water and soap. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling	Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.
Storage	Keep in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep out of reach of children and animals. Keep/store only in

original container.

Incompatible products Alkalis, Oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
n-Butanol (71-36-3)	TWA: 20 ppm	TWA: 100 ppm TWA: 300 mg/m ³	IDLH: 1400 ppm Ceiling: 50 ppm Ceiling: 150 mg/m ³	Mexico: Ceiling 50 ppm Mexico: Ceiling 150 mg/m ³
Chemical name	British Columbia	Quebec	Ontario TWAEV	Alberta
Propylene glycol (57-55-6)	-	-	TWA: 10 mg/m ³ aerosol only TWA: 50 ppm aerosol and vapor TWA: 155 mg/m ³ aerosol and vapor	-
n-Butanol (71-36-3)	TWA: 15 ppm Ceiling: 30 ppm	Ceiling: 50 ppm Ceiling: 152 mg/m ³ Skin	TWA: 20 ppm	TWA: 20 ppm TWA: 60 mg/m ³

Appropriate engineering controls

Engineering measures Apply technical measures to comply with the occupational exposure limits. Ensure adequate ventilation, especially in confined areas. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Individual protection measures, such as personal protective equipment

Eye/Face Protection For dust, splash, mist or spray exposure, wear chemical protective goggles.

Skin and Body Protection Wear long-sleeved shirt, long pants, socks, and shoes.

Hand Protection Protective gloves

Respiratory Protection For dust, splash, mist or spray exposures wear a filtering mask.

Hygiene measures 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 or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.

General information If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance White to off-white Liquid
Physical State Liquid
Color White to off white
Odor No information available
Odor threshold No information available

pH	4.33
Melting point/freezing point	Not applicable
Boiling Point/Range	No information available
Flash point	> 100 °C / > 212 °F
Evaporation Rate	No information available
Flammability (solid, gas)	No information available
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Density	1.15 g/mL (9.63 lb/gal)
Specific gravity	No information available
Water solubility	No information available
Solubility in other solvents	No information available
Partition coefficient	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	1574.8 @ 23 °C
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Molecular weight	No information available
Bulk density	No information available

10. STABILITY AND REACTIVITY

Reactivity	None under normal use conditions
Chemical Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	None known
Incompatible materials	Alkalis, Oxidizing agents.
Hazardous Decomposition Products	Carbon oxides (CO _x).

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral	3129 mg/kg (rat)
LD50 Dermal	> 2002 2000 mg/kg (rat)
LC50 Inhalation	> 2.05 mg/L (rat) (4-hr)

Serious eye damage/eye irritation	Slight irritation (rabbit).
Skin corrosion/irritation	Slightly irritating (rabbit).
Sensitization	Non-sensitizing.

Information on toxicological effects

Symptoms	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic toxicity	Prolonged exposure may cause chronic effects. Fomesafen: Prolonged exposure may cause adverse liver effects.
Mutagenicity	Fomesafen, Fluthiacet-methyl: Not genotoxic in laboratory studies.
Carcinogenicity	Fomesafen caused increased incidents of benign and malignant liver tumors in mice at the highest dose tested. This highest dose also caused an increase in mortality. No carcinogenic effects were observed in rats. Fluthiacet-methyl caused increases in benign pancreatic tumors in male rats at the highest dose, along with pancreatic and liver toxicity.

Neurological effects
Reproductive toxicity
Developmental toxicity

STOT - single exposure
STOT - repeated exposure

Target organ effects

Neurological effects
Aspiration hazard

There was an increase in liver tumors at two highest doses in male mice, along with hepatotoxicity, that could both be secondary to liver toxicity. New data indicates that there is no human risk.

Fomesafen, Fluthiacet-methyl: Not neurotoxic

Fomesafen, Fluthiacet-methyl: No toxicity to reproduction in animal studies.

Fomesafen: Not teratogenic in animal studies. Fluthiacet-methyl: A slight delay in fetal development in the rat, with no effects in the rabbit.

Not classified.

Causes damage to organs through prolonged or repeated exposure. See listed target organs below.

Fomesafen: Liver. Fluthiacet-methyl: Liver, bone marrow, spleen, pancreas, lymphatic system, hematopoietic system, uterus and blood.

Fomesafen, Fluthiacet-methyl: Not neurotoxic

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Fluthiacet-methyl (117337-19-6)

Active Ingredient(s)	Duration	Species	Value	Units
Fluthiacet-methyl	72 h LC50	Algae	0.00251	mg/L
	96 h LC50	Fish	0.043	mg/L
	48 h EC50	Crustacea	2.3	mg/L
	21 d NOEC	Fish	0.0027	mg/L
	21 d NOEC	Crustacea	0.035	mg/L

Fomesafen (72178-02-0)

Active Ingredient(s)	Duration	Species	Value	Units
Fomesafen	96 h LC50	Fish	170	mg/L
	48 h EC50	Crustacea	330	mg/L
	72 h EC50	Algae	0.17	mg/L
	21 d NOEC	Crustacea	100	mg/L

Persistence and degradability

Fomesafen: Moderately persistent. Fluthiacet-methyl: Non-persistent. Does not readily hydrolyze.

Bioaccumulation

Fomesafen, Fluthiacet-methyl: The substance does not have a potential for bioconcentration.

Mobility

Fomesafen: Medium mobility; has some potential to reach groundwater. Fluthiacet-methyl: Slightly mobile. Not expected to reach groundwater.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

Contaminated Packaging

Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

14. TRANSPORT INFORMATION

DOT

This material is not a hazardous material as defined by U.S. Department of Transportation at 49 CFR Parts 100 through 185.

TDG

Classification below is only applicable when shipped by vessel and is not applicable when shipped by road or rail only.

UN/ID no UN3082
Proper Shipping Name Environmentally hazardous substance, liquid, n.o.s.
Hazard class 9
Packing Group III
Description UN 3082, Environmentally hazardous substance, liquid, n.o.s. (Fluthiacet-methyl), 9, PGIII, Marine Pollutant

ICAO/IATA

UN/ID no UN3082
Proper Shipping Name Environmentally hazardous substance, liquid, n.o.s.
Hazard class 9
Packing Group III
Description UN 3082, Environmentally hazardous substance, liquid, n.o.s. (Fluthiacet-methyl), 9, PGIII, Marine Pollutant

IMDG/IMO

UN/ID no UN3082
Proper Shipping Name Environmentally hazardous substance, liquid, n.o.s.
Hazard class 9
Packing Group III
Marine Pollutant Fluthiacet-methyl
Description UN 3082, Environmentally hazardous substance, liquid, n.o.s. (Fluthiacet-methyl), 9, PGIII, Marine Pollutant

15. REGULATORY INFORMATION

U.S. Federal Regulations**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical name	CAS-No	Weight %	SARA 313 - Threshold Values %
Fomesafen - 72178-02-0	72178-02-0	30.08	1.0
n-Butanol - 71-36-3	71-36-3	1-5	1.0

SARA 311/312 Hazard Categories

Acute health hazard No
Chronic health hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Acetic Acid 64-19-7	5000 lb			X

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Acetic Acid 64-19-7	5000 lb 2270 kg	

n-Butanol 71-36-3	5000 lb 2270 kg	
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FIFRA Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING

Causes substantial, but temporary eye injury.

MARVEL HERBICIDE is very toxic to algae and moderately toxic to fish

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Fomesafen 72178-02-0	X		
Propylene glycol 57-55-6	X		X
n-Butanol 71-36-3	X	X	X

International Inventories

Chemical name	TSCA (United States)	DSL (Canada)	EINECS/ELINC S (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)
Fomesafen 72178-02-0			X		X			
Propylene glycol 57-55-6	X	X	X	X	X	X	X	X
n-Butanol 71-36-3	X	X	X	X	X	X	X	X

Mexico - Grade

Slight risk, Grade 1

Chemical name	Carcinogen Status	Mexico
n-Butanol		Mexico: Ceiling 50 ppm Mexico: Ceiling 150 mg/m ³

WHMIS Hazard Class

D2A - Very toxic materials

**16. OTHER INFORMATION**

Marvel™ Herbicide

SDS # : 7206-A

Revision date: 2016-05-26

Version 1.03

NFPA	Health Hazards 1	Flammability 1	Instability 0	Special Hazards -
HMIS	Health Hazards 1*	Flammability 1	Physical hazard 0	Personal Protection X

Revision date: 2016-05-26
Reason for revision: Initial Release

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Prepared By:

FMC Corporation

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End of Safety Data Sheet