

# Material Safety Data Sheet

## SOLSTICE HERBICIDE

MSDS #: 7453-A  
Revision Date: 2013-11-22  
Version 1



This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200 And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

### 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	SOLSTICE HERBICIDE
<b>Active Ingredient(s)</b>	Mesotrione, Fluthiacet-methyl
<b>Synonyms</b>	2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione; IUPAC name: methyl [2-chloro-4-fluoro-5-(5,6,7,8-tetrahydro-3-oxo-1H,3H-[1,3,4]thiadiazolo[3,4-a]pyridazin-1-ylideneamino)phenylthio]acetate; CAS name: methyl [[2-chloro-4-fluoro-5-[(tetrahydro-3-oxo-1H,3H-[1,3,4]thiadiazolo[3,4-a]pyridazin-1-ylidene)amino]phenyl]thio]acetate
<b>Chemical Family</b>	Benzoylcyclohexanedione, Thiadiazoles
<b>Recommended use:</b>	Herbicide
<b>Manufacturer</b>	<b><u>Emergency telephone number</u></b>
FMC Corporation Agricultural Products Group 1735 Market Street Philadelphia, PA 19103 General Information: Phone: (215) 299-6000 E-Mail: msdsinfo@fmc.com	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

<b><u>Appearance</u></b>	Off-white to beige liquid suspension
<b><u>Physical state</u></b>	Liquid
<b><u>Odor</u></b>	Mild organic
<b><u>Physical or Chemical Hazards</u></b>	
<b>Flammable properties</b>	Thermal decomposition can lead to release of irritating and toxic gases and vapors
<b><u>Potential health effects</u></b>	
<b>Acute effects</b>	
<b>Eyes</b>	May cause slight irritation.
<b>Skin</b>	Substance may cause slight skin irritation.
<b>Inhalation</b>	Inhalation of vapors in high concentration may cause irritation of respiratory system.
<b>Ingestion</b>	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause central nervous system depression.

<b>Chronic effects</b>	Repeated or prolonged exposure may cause central nervous system effects.
<b>Most Important Symptoms/Effects</b>	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
<b>Environmental hazard</b>	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### Hazardous ingredients

Chemical Name	CAS-No	Weight %
Mesotrione	104206-82-8	38.5
Propylene glycol	57-55-6	5-10
Fluthiacet-methyl	117337-19-6	2.2

### 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 treatment advice.
Inhalation	Move person to fresh air. If person is not breathing, call 911 (within the U.S. and Canada) or an ambulance, then give artificial respiration, preferably by 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.

### 5. FIRE-FIGHTING MEASURES

<b><u>Flammable properties</u></b>	Thermal decomposition can lead to release of irritating and toxic gases and vapors
<b>Flash Point</b>	> 100 °C / > 212 °F
<b>Sensitivity to Mechanical Impact</b>	Not applicable
<b>Sensitivity to Static Discharge</b>	Not applicable
<b>Suitable extinguishing media</b>	Foam. Carbon dioxide (CO <sub>2</sub> ). Dry chemical. Water spray or fog.
<b>Protective equipment and precautions for firefighters</b>	As in any fire, wear self-contained breathing apparatus and full protective gear. Isolate fire area. Evacuate downwind.
<b><u>NFPA</u></b>	
<b>Health Hazard</b>	1
<b>Flammability</b>	1
<b>Stability</b>	1
<b>Special Hazards</b>	-

## 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	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.
<b>Environmental precautions</b>	Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.
<b>Methods for containment</b>	Dike to prevent runoff. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
<b>Methods for cleaning up</b>	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.
<b>Other</b>	For further clean-up instructions call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

## 7. HANDLING AND STORAGE

<b>Handling</b>	Avoid breathing vapors or mists. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.
<b>Storage</b>	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. Store in original container only. Do not store in mild steel drums or vessels. Stainless steel and plastic drums are suitable for storage.

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

### Exposure guidelines

Chemical Name	British Columbia	Quebec	Ontario TWAEV	Alberta
Propylene glycol 57-55-6			TWA: 10 mg/m <sup>3</sup> TWA: 50 ppm TWA: 155 mg/m <sup>3</sup>	

### Occupational exposure controls

<b>Engineering measures</b>	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.
<b>Personal Protective Equipment</b>	
<b>General Information</b>	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.
<b>Respiratory protection</b>	For dust, splash, mist or spray exposures wear a filtering mask.
<b>Eye/face protection</b>	For dust, splash, mist or spray exposure, wear chemical protective goggles or a face-shield.
<b>Skin and body protection</b>	Wear long-sleeved shirt, long pants, socks, shoes, chemical-resistant gloves and headgear.
<b>Hand protection</b>	Protective gloves
<b>Hygiene measures</b>	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.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Appearance</b>	Off-white to beige liquid suspension
<b>Color</b>	Off-white to beige
<b>Physical state</b>	Liquid
<b>Odor</b>	Mild organic
<b>pH</b>	3.48 @ 23.5 °C (1.01 % suspension in water)
<b>Melting Point/Range</b>	No information available.
<b>Freezing point</b>	No information available
<b>Boiling Point/Range</b>	Not applicable
<b>Flash Point</b>	> 100 °C / > 212 °F
<b>Evaporation rate</b>	Not applicable
<b>Flammable properties</b>	Thermal decomposition can lead to release of irritating and toxic gases and vapors
<b>Vapor pressure</b>	No information available
<b>Vapor density</b>	No information available
<b>Density</b>	1.19 g/mL @ 22.8 °C
<b>Bulk density</b>	9.9 lb/gal @ 22.8 °C
<b>Water solubility</b>	Dispersible in water
<b>Percent volatile</b>	<20%
<b>Partition coefficient:</b>	Not applicable
<b>Viscosity</b>	1500-3000 cps

## 10. STABILITY AND REACTIVITY

<b>Stability</b>	Stable under normal conditions with greater than 10% water content. Upon storage low levels of hydrogen cyanide gas may develop in container headspace.
<b>Conditions to avoid</b>	Do not allow evaporation to dryness. Heat, flames and sparks. Temperatures above 55°C.
<b>Hazardous decomposition products</b>	Carbon oxides. Hydrogen cyanide.
<b>Hazardous polymerization</b>	Hazardous polymerization does not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute effects

<b>Eye contact</b>	Slightly or non-irritating (rabbit).
<b>Skin contact</b>	Slightly or non-irritating (rabbit).
<b>LD50 Dermal</b>	> 2000 mg/kg (Rat)
<b>LD50 Oral</b>	> 5000 mg/kg (Rat)
<b>LC50 Inhalation:</b>	> 2 mg/L (Rat)

<b>Sensitization</b>	Non-sensitizing
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### Chronic effects

<b>Chronic Toxicity</b>	Repeated or prolonged exposure may cause central nervous system effects.
<b>Carcinogenicity</b>	Mesotrione: Did not show carcinogenic effects in animal experiments. Fluthiacet-methyl caused increases in benign tumors of pancreas in male rats at highest dose, along with pancreatic and liver toxicity. Increase in liver tumors at two highest doses in male mouse, along with hepatotoxicity, that could both be secondary to porphyria. Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).
<b>Mutagenicity</b>	Mesotrione: Not mutagenic. Fluthiacet-methyl was positive in in-vitro chromosomal aberration tests and negative in in-vivo tests of mutagenicity, chromosomal aberrations, clastogenicity, DNA damage and dominant lethality.
<b>Reproductive toxicity</b>	Mesotrione: No toxicity to reproduction. Fluthiacet-methyl: Reproductive toxicity was observed in the rat only at doses well in excess of those causing systemic toxicity in parents.

**Neurological Effects** Mesotrione, Fluthiacet-methyl: Not neurotoxic.

**Developmental Toxicity** Mesotrione: Not a reproductive hazard. Fluthiacet-methyl: A slight delay in fetal development in the rat, with no effects in the rabbit.

**Target Organ Effects** Mesotrione: Animal studies showed evidence of reduced bodyweight gain, increased liver and kidney weights, blood effects (polycythemia, reduced white blood cell count) and eye effects (cataract formation, keratitis). Fluthiacet-methyl: Chronic and subchronic toxicity tests have shown effects on the liver, bone marrow, spleen, pancreas, lymphatic system, hematopoietic system, uterus and blood at high doses. High doses of fluthiacet-methyl have been shown to increase the incidence of liver tumors in male mice and pancreatic tumors in male rats.

**Chronic Toxicity - Other Ingredient(s)** Repeated overexposure to propylene glycol can produce central nervous system depression, hemolysis and minimal kidney damage.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

<b>Mesotrione (104206-82-8)</b>				
Active Ingredient(s)	Duration	Species	Value	Units
Mesotrione	96 h LC50	Rainbow trout	>114	ppm
	5 day EC50	Algae	1.9	ppm
	48 h EC50	Daphnia magna	840	ppm
	14 day LD50	Bobwhite quail	>2000	mg/kg

<b>Fluthiacet-methyl (117337-19-6)</b>				
Active Ingredient(s)	Duration	Species	Value	Units
Fluthiacet-methyl	72 h LC50	Algae	0.00251	mg/L
	48 h LC50	Daphnia magna	>2.3	mg/L
	LC50	Bluegill sunfish	0.14	mg/L
	LC50	Rainbow trout	0.43	mg/L
	LD50 Oral	Bobwhite quail	>2250	mg/kg
	LD50 Oral	Mallard duck	>2250	mg/kg

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Propylene glycol	19000 mg/L EC50 96 h (Pseudokirchneriella subcapitata)	LC50= 51600 mg/L Oncorhynchus mykiss 96 h LC50 41 - 47 mL/L Oncorhynchus mykiss 96 h LC50= 51400 mg/L Pimephales promelas 96 h LC50= 710 mg/L Pimephales promelas 96 h		EC50 > 10000 mg/L 24 h EC50 > 1000 mg/L 48 h

**Environmental Fate**

<b>Mesotrione (104206-82-8)</b>		
Active Ingredient(s)	Type of Test	Result
Mesotrione	Mobility in soil	Relatively mobile in soil
	Stability in water	Stable in water.
	Soil degradation	Not persistent in soil

<b>Fluthiacet-methyl (117337-19-6)</b>		
Active Ingredient(s)	Type of Test	Result
Fluthiacet-methyl	Bioconcentration factor (BCF) Bluefill sunfish (Lepomis macrochirus)	240
	log Pow	4.1

	Mobility in soil	Not expected to reach groundwater
	Soil degradation	<2 days
	Stability in water	Hydrolysis half-life of 18 days (pH 7); Stable at pH 5 and unstable at pH 9.

**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.

**Packaging Type**                                      Bulk, Non-Bulk

**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  
**Marine pollutant**    Mesotrione, Fluthiacet-methyl.  
**Description**    UN3082, Environmentally hazardous substance, liquid, n.o.s. (Mesotrione, 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  
**Marine pollutant**    Mesotrione, Fluthiacet-methyl  
**Description**    UN3082, Environmentally hazardous substance, liquid, n.o.s. (Mesotrione, 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  
**EmS No.**    F-A, S-F  
**Marine pollutant**    Mesotrione, Fluthiacet-methyl  
**Description**    UN3082, Environmentally hazardous substance, liquid, n.o.s. (Mesotrione, 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 does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazard Categories**

<b>Acute Health Hazard</b>	yes
<b>Chronic Health Hazard</b>	yes
<b>Fire Hazard</b>	no
<b>Sudden Release of Pressure Hazard</b>	no
<b>Reactive Hazard</b>	no

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

**TSCA Inventory (United States of America)**

**International Regulations**

**Mexico - Grade** Slight risk, Grade 1  
**Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class** Non-controlled

**16. OTHER INFORMATION**

**Revision Date:** 2013-11-22  
**Reason for revision:** Initial Release.

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**End of Material Safety Data Sheet**