SAFETY DATA SHEET
SPARTAN® 4 F HERBICIDE

SDS #: 1466-1-A
Revision date: 2016-05-26
Format: NA
Version 1.01

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name
SPARTAN® 4 F HERBICIDE

Formula code
6527-A

Other means of identification

Product Code(s)
1466-1-A

Synonyms
SULFENTRAZONE (FMC 97285):
2′,4′-dichloro-5′-(4-difluoromethyl-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl)
methanesulfonanilide (IUPAC name);
N-[2,4-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-
1,2,4-triazol-1-yl]phenyl] methanesulfonamide (CAS name)

Active Ingredient(s)
Sulfentrazone,

Chemical Family
Triazolinones

Alternate Commercial Name
Authority™ 4 F; Boral™ 480 SC; Authority™ 480 SC

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
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)

Medical Emergencies:
1 800 / 331-3148 (PROSAR - U.S.A. & Canada)
1 651 / 632-6793 (PROSAR - All Other Countries - Collect)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).
Specific target organ toxicity (repeated exposure) Category 2

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Warning

Hazard Statements
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary Statements - Prevention
P260 - Do not breathe dust/fume/gas/mist/vapors/spray

Precautionary Statements - Response
P314 - Get medical advice/attention if you feel unwell

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.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Family
Triazolinones.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfentrazone</td>
<td>122836-35-5</td>
<td>40</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>57-55-6</td>
<td>5-10</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>1-5</td>
</tr>
</tbody>
</table>

Synonyms are provided in Section 1.

4. FIRST AID MEASURES

Eye Contact
Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. 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, contact emergency medical services, 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. 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

Central nervous system effects.

Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media


Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Explosion data

Sensitivity to Mechanical Impact

Not sensitive.

Sensitivity to Static Discharge

Not sensitive.

Protective equipment and precautions for firefighters

Wear self-contained breathing apparatus and protective suit.

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

Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains.

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. Store in original container.

Incompatible products

None known

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
### Appropriate engineering controls

**Engineering measures**

Apply technical measures to comply with the occupational exposure limits. 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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Off-white Liquid</td>
</tr>
<tr>
<td><strong>Physical State</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Off-white</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Low Alcohol</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>5.3-6.0 @ 20 °C</td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>123 °C</td>
</tr>
<tr>
<td><strong>Boiling Point/Range</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>&gt; 94 °C / &gt; 201 °F Tag Closed Cup</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Flammability Limit in Air</strong></td>
<td>No information available</td>
</tr>
</tbody>
</table>

**Upper flammability limit:**

No information available

**Lower flammability limit:**

No information available

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10. STABILITY AND REACTIVITY

Reactivity
None under normal use conditions.
Chemical Stability
Stable.
Possibility of Hazardous Reactions
None under normal processing.
Hazardous polymerization
Hazardous polymerization does not occur.
Conditions to avoid
Excessive heat
Incompatible materials
None known.
Hazardous Decomposition Products
Carbon oxides (COx), Nitrogen oxides (NOx), Sulfur oxides, Hydrogen chloride, Hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral
2084 mg/kg (rat)
LD50 Dermal
> 2000 mg/kg (rabbit)
LC50 Inhalation
> 2.72 mg/L 4 hr (rat) - Maximum attainable concentration (zero mortality)

Serious eye damage/eye irritation
Non-irritating.
Skin corrosion/irritation
Minimally irritating.
Sensitization
Did not cause sensitization on laboratory animals.

Information on toxicological effects

Symptoms
Signs of toxicity in laboratory animals given sulfentrazone included clonic convulsions, ataxia, hypersensitivity to touch, chromorhinorrhea, abdominogenital staining, decreased locomotion, lacrimation, nasal discharge, and squinting eyes.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic toxicity
Sulfentrazone: Prolonged exposure cause decreased hemoglobin content and hematocrit, and increased spleen weight and splenic extramedullary hematopoiesis at high doses in animal studies
Mutagenicity
Sulfentrazone: Not genotoxic in animal studies
Carcinogenicity
Sulfentrazone: No evidence of carcinogenicity from animal studies
Neurological effects
Sulfentrazone: Clinical signs of neurotoxicity in laboratory animals was observed at high dose levels.
Reproductive toxicity
Sulfentrazone: No toxicity to reproduction in animal studies.
Developmental toxicity
Sulfentrazone: Fetal weight decreased; delayed skeletal ossification observed at maternally non-toxic doses are reversible effects and a dose-response is established; malformations observed in fetuses at maternally toxic doses and consistent with the mode of action for protoporphyrongen oxidase inhibitors. Developmental toxicity testing and results were generated for sulfentrazone with toluene present as an impurity.
12. ECOLOGICAL INFORMATION

Ecotoxicity

<table>
<thead>
<tr>
<th>Sulfentrazone (122836-35-5)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfentrazone</td>
<td>72 h EC50</td>
<td>Algae</td>
<td>32.8</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>48 h EC50</td>
<td>Crustacea</td>
<td>60.4</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>96 h LC50</td>
<td>Fish</td>
<td>94</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>21 d NOEC</td>
<td>Fish</td>
<td>5.9</td>
<td>mg/L</td>
</tr>
<tr>
<td></td>
<td>21 d NOEC</td>
<td>Crustacea</td>
<td>0.51</td>
<td>mg/L</td>
</tr>
</tbody>
</table>

Persistence and degradability
Sulfentrazone: Persistent, Does not readily hydrolyze, Not readily biodegradable.

Bioaccumulation
Sulfentrazone: The substance does not have a potential for bioconcentration.

Mobility
Sulfentrazone: Mobile, Has potential to reach ground water.

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

Marine Pollutant
Sulfentrazone.

Description
UN3082, Environmentally hazardous substance, liquid, n.o.s. (sulfentrazone), 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
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:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene - 108-88-3</td>
<td>108-88-3</td>
<td>1-5</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute health hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic health hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire hazard</td>
<td>No</td>
</tr>
<tr>
<td>Sudden release of pressure hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

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):

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene 108-88-3</td>
<td>1000 lb</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sodium Hydroxide 1310-73-2</td>
<td>1000 lb</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

CERCLA

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene 108-88-3</td>
<td>1000 lb</td>
<td>454 kg</td>
</tr>
<tr>
<td>Sodium Hydroxide 1310-73-2</td>
<td>1000 lb</td>
<td>454 kg</td>
</tr>
</tbody>
</table>

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:

CAUTION
Causes moderate eye irritation. Harmful if inhaled, swallowed, or absorbed through skin.
This pesticide is toxic to marine/estuarine invertebrates

US State Regulations
California Proposition 65
This product contains the following Proposition 65 chemicals.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>California Prop. 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene - 108-88-3</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol 57-55-6</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toluene 108-88-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

International Inventories

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>TSCA (United States)</th>
<th>DSL (Canada)</th>
<th>EINECS/ELINC S (Europe)</th>
<th>ENCS (Japan)</th>
<th>China (IECSC)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol 57-55-6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Toluene 108-88-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Mexico - Grade
Slight risk, Grade 1

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Carcinogen Status</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td></td>
<td>Mexico: TWA 50 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 188 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Mexico - Pollutant Release and Transfer Register - Reporting Emissions for Fabrication, Process or Use -Threshold Quantities</th>
<th>Pollutant Release and Transfer Register - Reporting Emissions - Threshold Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>1000 5000 kg/yr</td>
<td>1000 kg/yr</td>
</tr>
</tbody>
</table>

WHMIS Statement
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
D2A - Very toxic materials

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA Health Hazards 1</th>
<th>Flammability 1</th>
<th>Instability 0</th>
<th>Special Hazards -</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS Health Hazards 1*</td>
<td>Flammability 1</td>
<td>Physical hazard 0</td>
<td>Personal Protection X</td>
</tr>
</tbody>
</table>

Revision date: 2016-05-26
Reason for revision: (M)SDS sections updated
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End of Safety Data Sheet