

MATERIAL SAFETY DATA SHEET

SULFENTRAZONE IN TOLUENE



MSDS Ref. No.: F17-67-4
Date Approved: 11/24/2004
Revision No.: 3

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.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: SULFENTRAZONE IN TOLUENE
PRODUCT CODE: None Assigned
ACTIVE INGREDIENT(S): Sulfentrazone
CHEMICAL FAMILY: Aryl Triazolinones
MOLECULAR FORMULA: $C_{11}H_{10}Cl_2F_2N_4O_3S$ (sulfentrazone)
SYNONYMS: FMC 97285; F6285; N-[2,4-dichloro-5-[4-difluoromethyl]-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]phenyl]methanesulfonamide; IUPAC: N-[2,4-dichloro-5-(4-difluoromethyl-3-methyl-5-oxo-4,5-dihydro-[1,2,4]triazol-1-yl)phenyl]methane sulfonamide
ALTERNATE PRODUCT NAME(S): Step 7

MANUFACTURER

FMC CORPORATION
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103
(215) 299 6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.A. & Canada)
(202) 483-7616 (CHEMTREC - All Other Countries)
(800) 331-3148 (FMC - U.S.A. & Canada)
(716) 735-3765 (Reverse charges - FMC)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Tan mixture with a sharp odor.
- Extremely flammable (see Flash Point in 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.
- Highly toxic to algae.
- Slightly toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Expected to be severely irritating to the eyes and skin.

POTENTIAL HEALTH EFFECTS: Effects from overexposure may result from swallowing or contact with the eyes or skin. This product is expected to be severely irritating to the eyes and skin. Symptoms of overexposure include convulsions, decreased locomotion, tearing, increased sensitivity to touch, bloody discharge from the nose, and incoordination.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt. %	EC No.	EC Class
Sulfentrazone	122836-35-5	10 - 18	None	Not classified
Toluene	108-88-3	77 - 85	203-625-9	R11-38-48/20-63-65-67; S2-36/37-46-62
1-(2,4-Dichloro-5-aminophenyl)-4-difluoromethyl-4,5-dihydro-3-methyl-1H-1,2,4-triazol-5-one	111992-18-8	1 - 2	None	Not classified
Pyridine	110-86-1	1 - 2	203-809-9	R11, 20/21/22; S2, 26, 28
Methane sulfonyl chloride	124-63-0	1 - 2	204-706-1	None

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor immediately.

SKIN: Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. See a medical doctor immediately.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. 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, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: This product is expected to have low oral and dermal toxicity. It is expected to be severely irritating to the eyes and skin. Contains toluene which can 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: Extremely flammable. Avoid exposure to heat sources.

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. Remove ignition sources. 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 industrial detergent and water, and add the solution 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. Do not contaminate other materials, or allow this material to be contaminated, by improper storage or handling.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Toluene	50 ppm (TWA) (skin)	200 ppm (PEL) 300 ppm (STEL)	

Chemical Name	ACGIH	OSHA	Supplier
Pyridine		5 ppm (PEL)	

ENGINEERING CONTROLS: Use local exhaust at all process locations where vapor or mist may be emitted.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: For splash, mist, vapor or dust exposure wear chemical protective goggles or a face shield.

RESPIRATORY: For splash, spray or mist exposure wear, as a minimum, a properly fitted half-face or full-face air-purifying respirator with organic vapor or acid/gas cartridge (approved by U.S. NIOSH/MSHA, EU CEN or comparable certification organization). Respirator use and selection must be based on airborne concentrations. For unknown or emergency situations, use a self-contained breathing apparatus (SCBA).

PROTECTIVE CLOTHING: Depending upon concentrations encountered, wear coveralls or long-sleeved uniform and head covering. Wear Tychem® 9400 suit for dermal protection. PVC and neoprene may be suitable for splash protection, but will be permeated quickly by toluene. Leather items - such as shoes, belts and watchbands - that become contaminated must be removed and destroyed.

GLOVES: Wear chemical protective gloves such as Silvershield® brand 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 or using tobacco. Shower at the end of the workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Sharp
APPEARANCE:	Tan mixture
BOILING POINT:	43.3°C (110.6°F) (toluene)
DENSITY / WEIGHT PER VOLUME:	7.2 lb/gal.
FLASH POINT:	4.4 °C (40 °F) (CC)toluene
MELTING POINT:	123°C (253°F) (sulfentrazone)
MOLECULAR WEIGHT:	387.19 (Step 7)

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Expected to be severely irritating.

SKIN EFFECTS: Expected to be severely irritating.

DERMAL LD₅₀: sulfentrazone: > 2,000 mg/kg (rabbit)

ORAL LD₅₀: sulfentrazone: 2,689 mg/kg (rat)

INHALATION LC₅₀: sulfentrazone: > 4.13 mg/l (4 h) Maximum attainable concentration - zero mortality

ACUTE EFFECTS FROM OVEREXPOSURE: This product is expected to have low oral and dermal toxicity. It is expected to be severely irritating to the eyes and skin. Signs of toxicity in laboratory animals included clonic convulsions, ataxia, hypersensitivity to touch, chromorhinorrhea, abdominogenital staining, decreased locomotion, lacrimation, nasal discharge, and squinting eyes. Effects observed in laboratory animals after acute inhalation of toluene included mucous membrane irritation, motor incoordination, prostration, changes in respiratory rate, changes in serum and blood enzyme activities, elevated blood glucose and packed cell volume, decreased body weight and death. Vomiting after ingestion of this product may cause aspiration of toluene into the lungs, which may result in fatal pulmonary edema. Inhalation exposure to pyridine caused irritation to the mucous membranes and ocular and upper respiratory tract irritation. High oral doses of pyridine caused severe vomiting, diarrhea, delirium, hyperpyrexia, pulmonary edema and tracheobronchitis. Symptoms of exposure to methane sulfonyl chloride include burning sensations, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the mixture. Sulfentrazone was not carcinogenic in lifetime feeding studies with laboratory animals, nor was it found to be mutagenic in a battery of tests. In a reproduction study, sulfentrazone produced adverse effects on the growth and survival of the offspring, decreased male fertility and oligospermia at 25 mg/kg/day, and 35 mg/kg/day. Sulfentrazone was found to be fetotoxic in oral and dermal developmental toxicity studies; the fetal NOELS were 10 mg/kg/day and 100 mg/kg/day, respectively. At labeled use rates and practices of mixing and applying, expected exposure to farm workers is at least one hundred times lower than the doses that produced effects in laboratory animals. Chronic exposure to toluene may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage. Inhalation of toluene vapors at high doses have also resulted in an increased incidence of malformations and decreased fetal

weight in laboratory animals. Pyridine was evaluated in a battery of mutagenic tests, and it is considered to have an equivocal mutagenic potential. Exposure to pyridine may cause transient central nervous system effects, with symptoms such as nervousness, insomnia, headache and coma. Chronic exposure to pyridine may result in liver and kidney damage. Chronic respiratory conditions, such as asthma, may be aggravated due to exposure to methane sulfonyl chloride.

CARCINOGENICITY:

NTP:	Not listed
IARC:	Not listed
OSHA:	Not listed
OTHER:	Not Listed (ACGIH)

12. ECOLOGICAL INFORMATION

No data available for the mixture. Data presented below are based on sulfentrazone, FMC 97267 (5-Amino) or toluene, as noted.

ENVIRONMENTAL DATA: Sulfentrazone is stable in soil (half-life = 18 months). In water, sulfentrazone is stable to hydrolysis over the pH range of 5 to 9; however, it will readily undergo photolysis (half-life < 0.5 day). Sulfentrazone has a low affinity for organic matter ($K_{oc} = 43$), but is mobile only in soils with high sand content. The potential for sulfentrazone to bioaccumulate is very low, having a Log Pow of 1.48, and a bioconcentration factor of 1.1 - 2.0.

Toluene is expected to readily volatilize from both soil and water. Toluene is minimally soluble in water, readily bioavailable, and not expected to bioconcentrate. It is not expected to adsorb to soil and may leach to groundwater. High levels of toluene in soil may inhibit biodegradation. Degradation in groundwater may be slow.

ECOTOXICOLOGICAL INFORMATION: Sulfentrazone is slightly toxic to fish and aquatic arthropods, with LC_{50} values ranging from 60.4 mg/L to > 130 mg/L. Sulfentrazone has a very low order of toxicity to upland game birds (oral $LD_{50} > 2,250$ mg/kg).

FMC 97267 (5-Amino) is slightly toxic to rainbow trout with an acute 96-hour $LC_{50} = 64$ mg/L (estimated), and moderately to very highly toxic to algae with EC_{50} values ranging from 0.031 to 32.9 mg/L.

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

Toluene is expected to have low toxicity to aquatic and estuarine species. LC_{50} values, in fish, range from 6.41 to 240 mg/L and, to invertebrates, from 4.3 to 313 mg/L.

Pyridine is expected to have low toxicity to aquatic species (96-hour $LC_{50} = 93.8$ mg/L, fathead minnow).

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be recovered and reused, an acceptable method of disposal is to incinerate in accordance with local, state and national laws 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: 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
PROPER SHIPPING NAME:	Toluene mixture
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN 1294
PACKING GROUP:	II
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	Toluene mixture, UN 1294

PACKAGING TYPE:	Bulk
PROPER SHIPPING NAME:	Toluene mixture
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN 1294
PACKING GROUP:	II
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	1294
REPORTABLE QUANTITY (RQ):	Toluene
ADDITIONAL INFORMATION:	Toluene is in an RQ quantity at 1,176.5 pounds (163.4 gallons) per package. Pyridine would be in an "RQ" quantity at 50,000 pounds (6,944 gallons).

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PACKAGING TYPE:	Non-Bulk
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PROPER SHIPPING NAME:	Toluene mixture
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN 1294
PACKING GROUP:	II
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	Toluene mixture, UN 1294
ADDITIONAL INFORMATION:	EmS Number: F-E, S-D

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

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Toluene mixture
PRIMARY HAZARD CLASS / DIVISION:	3
CLASSIFICATION CODE:	F1
UN/NA NUMBER:	UN1294
PACKING GROUP:	II
HAZARD IDENTIFICATION NUMBER:	33
LABEL(S):	3
PLACARD(S):	3
MARKING(S):	UN 1294

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

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Toluene mixture
PRIMARY HAZARD CLASS / DIVISION:	3
UN/NA NUMBER:	UN1294
PACKING GROUP:	II
LABEL(S):	3
LIMITED QUANTITY:	Y305 / 1L
LIMITED QUANTITY: PASSENGER / CARGO:	305 / 5L

LIMITED QUANTITY: CARGO: 307 / 60L

ADDITIONAL INFORMATION: Marks: Toluene mixture, UN1294

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:
Toluene, Pyridine

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):

Listed

<u>Chemical Name</u>	<u>RQ</u>
Toluene	1,000 lb
Pyridine	1,000 lb

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):

Waste Number: U196, Pyridine

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT

U.S. EPA Signal Word: WARNING

INTERNATIONAL LISTINGS

Australian Hazard Code: 3XE

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:

Toluene, (Index #601-021-00-3):

EC Symbols:	F	(Highly Flammable)
	Xn	(Harmful)
	Xi	(Irritant)
EC Risk Phrases:	R11	(Highly flammable)
	R38	(Irritating to skin)
	R48/20	(Harmful: danger of serious damage to health by prolonged exposure through inhalation)
	R63	(Possible risk of harm to the unborn child)
	R65	(Harmful: may cause lung damage if swallowed.)
	R67	(Vapors may cause drowsiness and dizziness.)
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.)
	S62	(If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.)

Pyridine, (Index #613-002-00-7):

EC Symbols:	F	(Highly Flammable)
	Xn	(Harmful)
EC Risk Phrases:	R11	(Highly flammable)
	R20/21/22	(Harmful by inhalation, in contact with skin and if swallowed.)
EC Safety Phrases:	S2	(Keep out of the reach of children.)
	S26	(In case of contact with eyes, rinse immediately with plenty of water and seek medical advice)
	S28	(After contact with skin, wash immediately with plenty of water and soap.)

16. OTHER INFORMATION

EQUIPMENT INVOLVED: R-17100; R17160; T-17161; M-17170

REVISION SUMMARY:

This MSDS replaces Revision #2, dated August 08, 2000.

Changes in information are as follows:

New Format, as well as:

Section 3 (Composition / Information on Ingredients)

Section 11 (Toxicological Information)

Section 14 (Transport Information)

Section 15 (Regulatory Information)

Section 16 (Other Information)

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