

MATERIAL SAFETY DATA SHEET

AUTHORITY™ ASSIST HERBICIDE



MSDS Ref. No.: F18-60-4A

Date Approved: 02/18/2008

Revision No.: 1

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: AUTHORITY™ ASSIST HERBICIDE

PRODUCT CODE: 6354

ACTIVE INGREDIENT(S): Sulfentrazone*; Imazethapyr**

CHEMICAL FAMILY: Aryl Triazolinones*; Imidazolinone**

MOLECULAR FORMULA: C₁₂H₁₀Cl₂F₂N₄O₃S*; C₁₅H₁₉N₃O₃**

SYNONYMS: FMC 97285; F6285; CAS: 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*;
(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid**

ADDITIONAL SYNONYM(s): F7119 (formulation)

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:

- Off-white liquid with a faint, alcoholic 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 toxic to fish and aquatic organisms. Keep out of drains and water courses.

POTENTIAL HEALTH EFFECTS: Effects from overexposure result from either swallowing, inhaling, or coming into contact with the eyes or skin. Symptoms of overexposure include tremors, convulsions, salivation, diarrhea, coma, hypoactivity and piloerection.

MEDICAL CONDITIONS AGGRAVATED: Persons with pre-existing eye or skin conditions may be more sensitive to glycerin.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Sulfentrazone	122836-35-5	33.3	None	Not classified
Imazethapyr	81335-77-5	6.67	None	Not classified
Glycerin	56-81-5	<8	200-289-5	Not classified
Surfactant Blend		3.2	None	Not classified
Toluene	108-88-3	<2	203-625-9	R11-38-48/20-63-65-67; S2-36/37-46-62
Xanthan gum	11138-66-2	<0.2	234-394-2	Not classified

4. FIRST AID MEASURES

EYES: Flush with water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

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. 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 has low oral, dermal and inhalation toxicity. It is slightly irritating to the eyes and skin. It is non-sensitizing to the skin. Contains imazethapyr and toluene, both of which can produce a severe pneumonitis if aspirated during vomiting. Consideration should be given to gastric lavag 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 spill area, tools and equipment, wash with a suitable solution of caustic or soda ash, and an appropriate alcohol (i.e., methanol, ethanol or isopropanol). Follow this by washing with a strong soap and water solution. Absorb, as above, any excess liquid and add to the drums of waste already collected. Repeat if necessary. 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
Imazethapyr			10 mg/m ³ (TWA)
Glycerin	10 mg/m ³	15 mg/m ³ (total dust)	
Toluene	50 ppm (TWA) (skin)	200 ppm (PEL) 300 ppm (STEL)	
Xanthan gum		15 mg/m ³ (8-hour TWA) (total dust) 5 mg/m ³ (8-hour TWA) (respirable)	

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 butyl rubber, nitrile 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, chewing gum, or using tobacco. Shower at the end of the workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Faint, alcoholic
APPEARANCE:	Off-white liquid
DENSITY / WEIGHT PER VOLUME:	1.2 g/mL (10.0 lb/gal) at 21°C (70°F)
FLASH POINT:	76.6 °C (170 °F)
MOLECULAR WEIGHT:	387.19 (sulfentrazone) 289.3 (imazethapyr)
pH:	3.36 (1% dispersion) at 23°C (73.4°F)
SOLUBILITY IN WATER:	Disperses

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: Slightly irritating (rabbit)

SKIN EFFECTS: Slightly irritating (rabbit)

DERMAL LD₅₀: > 5,000 mg/kg (rat)

ORAL LD₅₀: 5,000 mg/kg (rat)

INHALATION LC₅₀: > 2.09 mg/l (4 h) (rat)

SENSITIZATION: (Skin) Non-sensitizing (mouse)

ACUTE EFFECTS FROM OVEREXPOSURE: This product has low oral, dermal and inhalation toxicity. It is slightly irritating to the skin and eyes. It is non-sensitizing to the skin. Signs of toxicity in laboratory animals, with sulfentrazone, included clonic convulsions, ataxia, hypersensitivity to touch, chromorhinorrhea, abdominogenital staining, decreased locomotion, lacrimation, nasal discharge, and squinting eyes.

Acute poisoning from ingestion of large quantities of liquid imidazolinone herbicide has resulted in hypotension, pulmonary dysfunction, oral mucosal and gastrointestinal irritation, leukocytosis, metabolic acidosis, and transient liver and renal dysfunction. Imidazolinone herbicides are CNS depressants, causing impaired consciousness and coma in some cases. Nausea and intense vomiting shortly following ingestion is common, and diarrhea may occur. Severe symptoms have included impairment of consciousness and respiratory distress requiring intubation. Decreased blood pressure may occur following excessive doses. Mucous membranes may become ulcerated following ingestions or splashes due to the corrosive action of imidazolinone. Aspiration pneumonitis is a common clinical occurrence following ingestions.

Glycerin is nontoxic after ingestion, except with very large doses, when it can cause headache, dizziness, nausea, vomiting, thirst, diarrhea and confusion. Glycerin had no systemic effects in humans after skin application. If it comes in direct contact with the eye, glycerin can cause stinging, burning sensations, tearing, and redness, but no injury. Severe dehydration, cardiac arrhythmias, and hyperosmolar nonketotic coma have been reported and may be fatal.

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.

Prolonged contact with dry xanthan gum powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration; due to the hygroscopic properties of the gums, they can form a paste or gel in the airway.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the formulation. 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.

Studies done on mice fed dietary imazethapyr found no carcinogenic effects. Imazethapyr has been shown to be non-mutagenic and non-clastogenic in reverse mutation assays and in chromosomal aberration assays.

When given to rats at a concentration of 5% in the drinking water for six months, glycerin caused calcification in the renal tubules. In another rat drinking water study, it increased urinary levels of oxalic acid. Glycerin was not mutagenic in the Ames Salmonella microsome assay. Glycerin was reported to induce chromosome aberrations in rat bone marrow and sperm cells, but an occupational cytogenetics study found no significant increase in chromosome aberrations. Glycerin did not cause birth defects in mice or rabbits. It is metabolized more rapidly in pregnant rats, than it is in non-pregnant rats. It was transferred to the rat fetus, but not appreciably to the mouse fetus. Rats given high levels of glycerin in the diet (30-60%) had slower reproduction, but this was probably because of caloric imbalance rather than a specific effect of

glycerin. Glycerin suppressed sperm production in rats when injected directly into the testes. When given orally to male rats at a dose of 100 mg/kg, it had no effect on fertility

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.

Long-term feeding studies, with xanthan gum, showed no adverse effects up to 1,000 mg/kg/day in rats and dogs. In a 3-generation reproduction study, there were no adverse effects at up to 500 mg/kg/day in rats.

12. ECOLOGICAL INFORMATION

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.

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 waterfowl (dietary $LC_{50} > 5620$ ppm) and upland game birds (oral $LD_{50} > 2,250$ mg/kg).

Imazethapyr

28-day NOEC = 97 mg/L (Fathead minnow)

96-hour LC_{50} = 340 mg/L (Rainbow trout)

96-hour LC_{50} = 420 mg/L (Bluegill sunfish, Cat fish)

48-hour EC_{50} > 1,000 mg/L (Daphnia magna)

96-hour EC_{50} = 71 mg/L (Selenastrum capricornutum)

2-hour EC_{50} > 100 mg/L (Spirillum volutans)

EC_{50} = 10 μ g/L (Lemna gibba)

LD_{50} > 2,150 mg/kg (oral, Bobwhite quail)

LC_{50} > 5,000 mg/L (Mallard duck)

48-hour LD_{50} > 100 mg/bee (contact); > 24.6 mg/bee (oral)

14-day LC_{50} > 15.7 mg/kg (soil, Earthworm)

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

PACKAGING TYPE: Bulk

ADDITIONAL INFORMATION: This material is not a hazardous material as defined by US Department of Transportation at 49 CFR Parts 100 through 185.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PACKAGING TYPE: Non-Bulk

ADDITIONAL INFORMATION: This material is not a dangerous good as defined by the International Maritime Dangerous Goods Code.

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

PACKAGING TYPE: Non-Bulk

ADDITIONAL INFORMATION: This material is not a dangerous good as defined by ADR.

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

PACKAGING TYPE: Non-Bulk

ADDITIONAL INFORMATION: This material is not a dangerous good as defined by ICAO and IATA.

Transport Association (IATA) Dangerous
Goods Regulations.

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

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

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)**CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):**

Listed

Chemical Name

Toluene

RQ

1,000 lb

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT

U.S. EPA Signal Word: CAUTION

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.)

16. OTHER INFORMATION

REVISION SUMMARY: New MSDS.

Authority and FMC - Trademarks of FMC Corporation

© 2008 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.