MATERIAL SAFETY DATA SHEET

AUTHORITY™ MTZ DF HERBICIDE

MSDS Ref. No.: F18-58-2a
Date Approved: 12/03/2008
Revision No.: 1

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200. The information contained herein is for the concentrate as packaged, unless otherwise noted.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	AUTHORITY™ MTZ DF HERBICIDE
PRODUCT CODE:	6351
ACTIVE INGREDIENT(S):	Sulfentrazone*; Metribuzin**
CHEMICAL FAMILY:	Aryl Triazolinones*; Triazinone**
MOLECULAR FORMULA:	$C_{12}H_{10}Cl_2F_2N_4O_3S$*; $C_8H_{14}N_4OS$**
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*; 4-amino-6-(1,1-dimethylethyl)-3-(methylthio)1,2,4-triazin-5(4H)-one**

U.S. EPA REGISTRATION NUMBER: 279-3340

MANUFACTURER

FMC CORPORATION
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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:

- Brown cylindrical granules with a musty odor.
- Slightly combustible. May support combustion at elevated temperatures.
- 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.
- Moderately irritating to the eyes.
- Cancer Hazard - Can cause cancer

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

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Sulfentrazone	122836-35-5	18	None	Not classified
Metribuzin	21087-64-9	27	244-209-7	Xn-N; R22-50/53
Surfactant Blend		<16	None	Not classified
Silica, quartz	14808-60-7	<2	238-878-4	Not classified
Toluene	108-88-3	<1	203-625-9	F - Xn; R11-38-48/20-63-65-67

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 or ophthalmologist immediately.

SKIN: Wash with plenty of water. Get medical attention if irritation occurs and persists.

INGESTION: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. See a medical doctor.

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 moderately irritating to the eyes and slightly irritating to the skin. It is non-sensitizing to the skin. This product contains a granular material (clay) that may cause mechanical irritation to the eyes. 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, CO_2 or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

FIRE / EXPLOSION HAZARDS: Slightly combustible. This material may support combustion at elevated temperatures.

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. Large spills should be covered to prevent dispersal. For dry material, use a wet sweeping compound or water to prevent the formation of dust. If water is used, prevent runoff or dispersion of excess liquid by diking and absorbing with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump all waste material, including absorbent, 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
Metribuzin	5 mg/m^3	5 mg/m^3	
Silica, quartz	0.025 mg/m^3 (8-hour TWA) (respirable fraction)	0.1 mg/m^3 (8-hour TWA) (respirable dust) 0.3 mg/m^3 (8-hour TWA) (total dust)	
Toluene	50 ppm (TWA) (skin)	200 ppm (PEL) 300 ppm (STEL)	

ENGINEERING CONTROLS: No open flames. Prevent deposition of dust; use closed system, consider use of dust explosion-proof electrical equipment and lighting. Use local exhaust at all process locations where dust may be emitted. Ventilate all transport vehicles prior to unloading.

PERSONAL PROTECTIVE EQUIPMENT

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

RESPIRATORY: For dust 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:	Musty
APPEARANCE:	Brown cylindrical granules
DENSITY / WEIGHT PER VOLUME:	(Bulk) 35 - 42 lb/cu ft.
MOLECULAR WEIGHT:	387.19 (sulfentrazone) 214.32 (metribuzin)
SOLUBILITY IN WATER:	Disperses
SPECIFIC GRAVITY:	1.21 @ 20°C (water = 1)

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: Moderately irritating

SKIN EFFECTS: Slightly irritating

DERMAL LD_{50}: > 5,000 mg/kg (rat)

ORAL LD_{50}: 5,000 mg/kg (rat)

INHALATION LC_{50}: > 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 moderately irritating to the eyes and slightly irritating to the skin. It is non-

sensitizing to the skin. Signs of toxicity in laboratory animals included tremors, convulsions, salivation, diarrhea, coma, hypoactivity and piloerection.

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.

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.

In studies with laboratory animals, metribuzin did not cause carcinogenicity, genotoxicity, it had no reproductive effects, and no developmental toxicity effects. Metribuzin can cause depression of the central nervous system, and target organs are the thyroid gland and the liver.

Repeated overexposure to crystalline silica for extended periods has caused acute silicosis. The International Agency for Research on Cancer (IARC) has classified crystalline silica, inhaled in the form of quartz or cristobalite from occupational sources, as carcinogenic to humans (Group 1). The National Toxicology Program (NTP) has classified respirable crystalline silica (quartz, cristobalite and tridymite) as a "known carcinogen". The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that sulfuric acid, contained in strong inorganic acid mists, is a 'Suspected Human Carcinogen' (A2 - limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans).

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.

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Silica, quartz	1	Known Carcinogen	Not listed	(ACGIH) A2

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 (Koc = 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.
Metribuzin is moderately persistent in soil. The half-life varies according to soil type and climactic conditions with soil half-lives of 30 - 120 days. Metribuzin is poorly bound to most soils and soluble in water with a potential for leaching in many soil types. Microbial degradation is the major mechanism for loss from soil. The half-life of metribuzin in pond water is approximately 7 days.

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).

Metribuzin is moderately to slightly toxic to birds, and slightly toxic to fish:
LD_{50} (acute) 100-200 mg/kg (bobwhite quail, mallard ducks, Japanese quail)
LC_{50} (5-8 day dietary) > 4,000 ppm (bobwhite quail, mallard ducks, japanese quail)
LC_{50} 96-hour = 64-76 mg/L (rainbow trout)
LC_{50} 96-hour = 80 mg/L (Bluegill sunfish)
LC_{50} 96-hour = 48.3 mg/L (marine / estuarine shrimp)
LC_{50} 48-hour = 48 mg/L (Daphnia magna)

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
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S):	Metribuzin
PRIMARY HAZARD CLASS / DIVISION:	9
UN/NA NUMBER:	UN 3077
PACKING GROUP:	III
MARINE POLLUTANT:	Metribuzin
LABEL(S):	Class 9, 9
PLACARD(S):	Class 9, 3077, 9
MARKING(S):	Environmentally hazardous substance, solid, n.o.s. (metribuzin), UN3077 + Marine Pollutant
ADDITIONAL INFORMATION:	EmS Number: F-A, S-F

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

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.
TECHNICAL NAME(S):	Metribuzin
CLASSIFICATION CODE:	M7
UN/NA NUMBER:	UN3077
MARINE POLLUTANT:	Metribuzin
LABEL(S):	9
PLACARD(S):	9
MARKING(S):	UN 3077 + Marine Pollutant

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

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Environmentally hazardous substance, solid, n.o.s.

PRIMARY HAZARD CLASS / DIVISION:	9
UN/NA NUMBER:	UN3077
PACKING GROUP:	III
LABEL(S):	9
LIMITED QUANTITY:	Y911 / 30 kg G
LIMITED QUANTITY: PASSENGER / CARGO:	911 / 400 kg
LIMITED QUANTITY: CARGO:	911 / 400 kg
ADDITIONAL INFORMATION:	This material is not a dangerous good as defined in ICAO and the International Air Transport Association (IATA) Dangerous Goods Regulations. This material is not regulated for shipment from, to, or within the USA by aircraft. Carfentrazone-ethyl is toxic to algae under ADR, and is identified as a Marine Pollutant for shipment from, to, or within ADR member countries as shown here. Marks: UN3077 + Marine Pollutant Marine Pollutant: Metribuzin

OTHER INFORMATION:

HARMONIZED SYSTEM
Import to the U.S.A.: 3808.93.1500
Export from the U.S.A.: 3808.93.0000

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	RQ
Toluene	1,000 lb

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT
U.S. EPA Signal Word: CAUTION

INTERNATIONAL LISTINGS

AUSTRALIAN HAZARD CODE: 3XE

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols:	F	(Highly Flammable)
	Xn	(Harmful)
	Xi	(Irritant)
	N	(Dangerous for the environment)
EC Risk Phrases:	R11	(Highly flammable)
	R22	(Harmful if swallowed.)
	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.)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
	R67	(Vapors may cause drowsiness and dizziness.)

16. OTHER INFORMATION

REVISION SUMMARY:
New MSDS.

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