

<p style="text-align: center;">MONSANTO COMPANY Safety Data Sheet Commercial Product</p>

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Product identifier

Certainty® Turf Herbicide

1.1.1. Chemical name

Not applicable.

1.1.2. Synonyms

None.

1.1.3. EPA Reg. No.

524-534

1.2. Product use

Herbicide

1.3. Company

MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167

Telephone: 800-332-3111, **Fax:** 314-694-5557

E-mail: safety.datasheet@monsanto.com

1.4. Emergency numbers

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).
FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

2. HAZARDS IDENTIFICATION

2.1. Classification

OSHA Hazard Communication Standard, 29 CFR 1910.1200 (2012)

Not classified as hazardous.

2.2. Appearance and odour (colour/form/odour)

Whitish /Granules, (free-flowing) / Odourless

2.3. OSHA Status

This product is not hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Refer to section 11 for toxicological and section 12 for environmental information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient

N-[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]-2-(ethylsulfonyl)imidazo[1,2-a]pyridine-3-sulfonamide;
{Sulfosulfuron}

Composition

COMPONENT	CAS No.	% by weight (approximate)
Sulfosulfuron	141776-32-1	75
Other ingredients		25

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

4.1. Description of first aid measures

- 4.1.1. Eye contact:** If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.
- 4.1.2. 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.
- 4.1.3. Inhalation:** If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.
- 4.1.4. Ingestion:** Call 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 the poison center or doctor. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

- 4.2.1. Eye contact, short term:** May cause temporary eye irritation.
- 4.2.2. Skin contact, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.
- 4.2.3. Inhalation, short term:** Not expected to produce significant adverse effects when recommended use instructions are followed.
- 4.2.4. Single ingestion:** Not expected to produce significant adverse effects when recommended use instructions are followed.

4.3. Indication of any immediate medical attention and special treatment needed

- 4.3.1. Medical conditions aggravated by exposure:** None.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- 5.1.1. Recommended:** Water, foam, dry chemical, carbon dioxide (CO₂)

5.2. Special hazards

5.2.1. Unusual fire and explosion hazards

Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

5.2.2. Hazardous products of combustion

Carbon monoxide (CO), carbon dioxide (CO₂), sulphur oxides (SO_x), nitrogen oxides (NO_x), ammonia (NH₃)

- 5.3. Fire fighting equipment:** Self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

5.4. Flash point

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

6.1. Environmental precautions

SMALL QUANTITIES:

Low environmental hazard.

LARGE QUANTITIES:

Minimise spread.

Keep out of drains, sewers, ditches and water ways.

6.2. Methods for cleaning up

SMALL QUANTITIES:

Sweep, scoop or vacuum to remove.

Wash spill area with detergent and water.

LARGE QUANTITIES:

Dig up heavily contaminated soil.

Refer to section 7 for types of containers.

Collect in containers for disposal.

Flush residues with small quantities of water.

Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

7.1. Precautions for safe handling

Avoid contact with eyes, skin and clothing. When using do not eat, drink or smoke. Avoid breathing dust.

Wash hands thoroughly after handling or contact. Wash contaminated clothing before re-use. Thoroughly clean equipment after use. Do not contaminate drains, sewers and water ways when disposing of equipment rinse water. Refer to section 13 of the safety data sheet for disposal of rinse water.

7.2. Conditions for safe storage

Maximum storage temperature: < 120 °F

Compatible materials for storage: stainless steel, galvanised steel, unlined mild steel, Heresite[™]-lined steel, mild steel, aluminium, fibreglass, plastic, polyvinylidene difluoride (PVDF), polypropylene (PP), high-density polyethylene (HDPE)

Incompatible materials for storage: none known.

Keep out of reach of children.

Keep away from food, drink and animal feed.

Keep only in the original container.

Keep container tightly closed in a cool, well-ventilated place.

Keep container off wet floors.

Minimum shelf life: 2 years.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Airborne exposure limits

Components	Exposure Guidelines
Sulfosulfuron	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

--	--

8.2. Engineering controls: No special requirement when used as recommended.

8.3. Recommendations for personal protective equipment

8.3.1. Eye protection: If there is significant potential for contact: Wear dust goggles.

8.3.2. Skin protection: No special requirement when used as recommended. Applicators and other handlers must wear: Wear long sleeved shirt, long pants and shoes with socks. Keep and wash personal protective equipment separately from other laundry. If no such instructions for washables, use detergent and hot water.

8.3.3. Respiratory protection: No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Whitish
Odour:	Odourless
Form:	Granules, (free-flowing)
Physical form changes (melting, boiling, etc.):	
Melting point:	No data.
Boiling point:	Not applicable.
Flash point:	Not applicable.
Explosive properties:	No explosive properties
Auto ignition temperature:	Does not self-ignite.
Self-accelerating decomposition temperature (SADT):	No data.
Oxidizing properties:	none
Specific gravity:	Not applicable.
Particle size:	> 99.5 % Mesh size 40
Vapour pressure:	No significant volatility.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	Not applicable.
Kinematic viscosity:	Not applicable.
Density:	33.8 lb/ft ³ ; (loose bulk density)
Solubility:	Water: Soluble
pH:	5.5 @ 10 g/l
Partition coefficient:	log Pow: < 1 (sulfosulfuron)

10. STABILITY AND REACTIVITY

10.1. Stability

Stable under normal conditions of handling and storage.

Hazardous polymerization: Does not occur.

10.2. Incompatible materials

none known.;

Compatible materials for storage: see section 7.2.

10.3. Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Likely routes of exposure: eye contact, Skin contact, inhalation

Potential health effects

Eye contact, short term: May cause temporary eye irritation.

Skin contact, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Inhalation, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Single ingestion: Not expected to produce significant adverse effects when recommended use instructions are followed.

Data obtained on product, similar products and on components are summarized below.

Skin irritation

Rabbit, 6 animals, Draize test:

Days to heal: 0

Primary Irritation Index (PII): 0.0/8.0

No skin irritation.

Eye irritation

Rabbit, 6 animals, OECD 405 test:

Days to heal: 3

Slight irritation.

Similar formulation

Acute oral toxicity

Rat, LD50: > 5,000 mg/kg body weight

Practically non-toxic. No mortality.

Acute dermal toxicity

Rat, LD50: > 5,000 mg/kg body weight

Practically non-toxic. No mortality.

Acute inhalation toxicity

Rat, LC50, 4 hours, dust: > 2.6 mg/L

Practically non-toxic.

Skin sensitization

Guinea pig, maximisation test:

Positive incidence: 0 %

Active ingredient

Genotoxicity

Not genotoxic.

Carcinogenicity

Urinary bladder tumours in rats and mice. Mode(s) of action not relevant to humans.

Reproductive/Developmental Toxicity

No reproductive effects in rats.

No developmental effects in rats or rabbits.

12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on similar products and on components are summarized below.

Similar formulation

Aquatic toxicity, fish

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity (limit test), 96 hours, static, LC50: > 97 mg/L

No more than slightly toxic.

Similar formulation

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity (limit test), 48 hours, static, EC50: > 144 mg/L

Practically non-toxic.

Aquatic toxicity, algae/aquatic plants

Green algae (*Pseudokirchneriella subcapitata*):

Acute toxicity, 72 hours, static, EC50: 71.4 µg/L

Very highly toxic.

Duckweed (*Lemna gibba*):

Acute toxicity, 7 day, semi-static, ErC50 (frond number): 1.20 µg/L

Very highly toxic.

Duckweed (*Lemna gibba*):

Acute toxicity, 7 day, semi-static, NOEC: 0.27 µg/L

Very highly toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 123 µg/bee

Practically non-toxic.

Honey bee (*Apis mellifera*):

Oral, 48 hours, LD50: > 128 µg/bee

Practically non-toxic.

Active ingredient

Avian toxicity

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

Practically non-toxic.

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

Practically non-toxic.

Bobwhite quail (*Colinus virginianus*):

Acute oral toxicity, single dose, LD50: > 2,250 mg/kg body weight

Practically non-toxic.

Mallard duck (Anas platyrhynchos):

Acute oral toxicity, single dose, LD50: > 2,250 mg/kg body weight
Practically non-toxic.

Soil organism toxicity, invertebrates

Earthworm (Eisenia foetida):

Acute toxicity (limit test), 14 days, LC50: > 848 mg/kg dry soil

Bioaccumulation

No significant bioaccumulation is expected.

Dissipation

Soil, field:

Half life: 11 - 47 days

Water, aerobic:

Half life: 16 - 20 days

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

13.1.1. Product

Keep out of drains, sewers, ditches and water ways. Recycle if appropriate facilities/equipment available. Burn in proper incinerator. Follow all local/regional/national/international regulations.

13.1.2. Container

See the individual container label for disposal information. Emptied packages retain product residue and dust. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Empty packaging completely. Store for collection by approved waste disposal service. Ensure packaging cannot be reused. Do NOT re-use containers. Recycle if appropriate facilities/equipment available. Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

14.1. US Dept. of Transportation (DOT) Hazardous Materials Regulations (49 CFR Parts 105-180)

14.1.1. Special provisions

This material meets the definition of a marine pollutant.

Non-bulk packagings are NOT hazardous via US domestic land transportation.

14.2. IMDG Code

14.2.1. Note

Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., LIMITED QUANTITY

14.3. IATA/ICAO

14.3.1. Note

Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

15. REGULATORY INFORMATION

15.1. Environmental Protection Agency

15.1.1. TSCA Inventory

Exempt

15.1.2. SARA Title III Rules

Section 311/312 Hazard Categories: Immediate
Section 302 Extremely Hazardous Substances: Not applicable.
Section 313 Toxic Chemical(s): Not applicable.

15.1.3. CERCLA Reportable quantity

Not applicable.

15.1.4. Federal Insecticide, Fungicide, Rodenticide Act (FIFRA)

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION!
CAUSES MODERATE EYE IRRITATION

Skin irritation: FIFRA category IV.
Eye irritation: FIFRA category III.
Acute oral toxicity: FIFRA category IV.
Acute dermal toxicity: FIFRA category IV.
Acute inhalation toxicity: FIFRA category IV.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.

Follow all local/regional/national/international regulations.

Please consult supplier if further information is needed.

In this document the British spelling was applied.

|| Significant changes versus previous edition.

This Safety Data Sheet has been prepared following the Regulation (EC) No. 1907/2006 (Annex II) as last amended by Regulation (EC) No. 453/2010

Data provided in this Safety Data Sheet are for the product as supplied unless otherwise indicated.

	Health	Flammability	Instability	Additional Markings
NFPA	1	1	1	

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

<p>This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for</p>
--

employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.