

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

1. PRODUCT AND COMPANY IDENTIFICATION

Product name

Certainty® Turf Herbicide

EPA Reg. No.

524-534

Product use

Herbicide

Chemical name

Not applicable.

Synonyms

None.

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

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

Emergency overview

Appearance and odour (colour/form/odour): Whitish / Granules, (free-flowing) / Odourless

CAUTION!

CAUSES MODERATE EYE IRRITATION

Potential health effects

Likely routes of exposure

eye contact, Skin contact, inhalation

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.

Potential environmental effects

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

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

OSHA Status

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

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.

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.

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.

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.

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.

5. FIRE-FIGHTING MEASURES

Flash point

Not applicable.

Extinguishing media

Recommended: Water, foam, dry chemical, carbon dioxide (CO₂)

Unusual fire and explosion hazards

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

Hazardous products of combustion

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

Fire fighting equipment

Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions

- SMALL QUANTITIES:
 - Low environmental hazard.
- LARGE QUANTITIES:
 - Minimise spread.
 - Keep out of drains, sewers, ditches and water ways.

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.

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.
- Emptied packages retain product residue and dust.

Storage

- Maximum storage temperature: < 120 °F
- 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

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.

Engineering controls

No special requirement when used as recommended.

Eye protection

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

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.

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.
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

Stability

Stable under normal conditions of handling and storage.

Oxidizing properties

none

Hazardous decomposition

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

Self-accelerating decomposition temperature (SADT)

No data.

Hazardous polymerization

Does not occur.

11. TOXICOLOGICAL INFORMATION

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

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
FIFRA category IV.
No skin irritation.

Eye irritation

Rabbit, 6 animals, OECD 405 test:

Days to heal: 3
Slight irritation.
FIFRA category III.

Similar formulation

Acute oral toxicity

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

Practically non-toxic.
FIFRA category IV.
No mortality.

Acute dermal toxicity

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

Practically non-toxic.
FIFRA category IV.
No mortality.

Acute inhalation toxicity

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

Practically non-toxic.
FIFRA category IV.

Skin sensitization

Guinea pig, maximisation test:

Positive incidence: 0 %

Active ingredient

Mutagenicity

In vitro and in vivo mutagenicity test(s):

Not mutagenic.

Repeated dose toxicity

Rat, oral, 90 days:

NOAEL toxicity: 6,000 mg/kg diet

Other effects: weight loss

Mouse, oral, 90 days:

NOAEL toxicity: > 7,000 mg/kg diet

Other effects: none

Chronic effects/carcinogenicity

Mouse, oral, 18 months:

NOAEL toxicity: 700 mg/kg diet

Target organs/systems: urinary bladder

Other effects: histopathologic effects, blood biochemistry effects

NOEL tumour: 3,000 mg/kg diet

Tumours: urinary bladder

Tumours not relevant to man.

Rat, oral, 22 months:

NOAEL toxicity: 500 mg/kg diet

Target organs/systems: urethra, urinary bladder, kidneys

Other effects: organ weight change, histopathologic effects, increased mortality

NOEL tumour: 500 mg/kg diet

Tumours: urinary bladder, (carcinoma)

Tumours: urinary bladder, (papilloma)

Tumours not relevant to man.

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 5,000 mg/kg diet

NOAEL reproduction: 20,000 mg/kg diet

Target organs/systems in parents: kidneys

Other effects in parents: weight loss, decrease of body weight gain, organ weight change

Target organs/systems in pups: none

Other effects in pups: none

Developmental toxicity/teratogenicity

Rat, oral, 6 - 15 days of gestation:

NOAEL toxicity: 1,000 mg/kg body weight/day

NOAEL development: 1,000 mg/kg body weight/day

Target organs/systems in mother animal: none

Other effects in mother animal: none

Developmental effects: none

Rabbit, oral, 7 - 18 days of gestation:

NOAEL toxicity: 1,000 mg/kg body weight/day

NOAEL development: 1,000 mg/kg body weight/day

Target organs/systems in mother animal: none

Other effects in mother animal: none

Developmental effects: none

12. ECOLOGICAL INFORMATION

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

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

Arthropod toxicity

Honey bee (*Apis mellifera*):

Oral/contact, 48 hours, LD50: > 26.5 µg/bee

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.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity (limit test), 48 hours, static, EC50: > 101 mg/L
Practically non-toxic.

Similar formulation

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 72 hours, static, EC50: 0.12 mg/L
Highly 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

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.

Container

See the individual container label for disposal information.
Emptied packages retain product residue and dust.
Observe all labelled 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.

Not regulated in non-bulk packages.

Special provisions

This material meets the definition of a marine pollutant.

IMDG Code

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

IATA/ICAO

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

15. REGULATORY INFORMATION

TSCA Inventory

Exempt

OSHA Hazardous Components

Surfactant(s)

SARA Title III Rules

Section 311/312 Hazard Categories

Immediate

Section 302 Extremely Hazardous Substances

Not applicable.

Section 313 Toxic Chemical(s)

Not applicable.

CERCLA Reportable quantity

Not applicable.

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 as last amended by Regulation (EC) No. 453/2010

	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)

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 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.

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