Product Name: SHOWCASE* Herbicide Issue Date: 10/28/2008
Print Date: 20 Mar 2009

Dow AgroSciences LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

SHOWCASE* Herbicide

COMPANY IDENTIFICATION

Dow AgroSciences LLC A Subsidiary of The Dow Chemical Company 9330 Zionsville Road Indianapolis, IN 46268-1189 USA

Customer Information Number: 800-992-5994

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994 **Local Emergency Contact:** 800-992-5994

2. Hazards Identification

Emergency Overview

Color: Green

Physical State: Granules Odor: Characteristic Hazards of product:

CAUTION! Causes eye irritation. May cause skin irritation. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: Solid or dust may cause irritation or corneal injury due to mechanical action.

Skin Contact: Brief contact is essentially nonirritating to skin.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

* Indicates a Trademark

^{*} Indicates a Trademark of Dow AgroSciences LLC

Skin Sensitization: For the active ingredient(s): Trifluralin. Has caused allergic skin reactions when tested in guinea pigs.

Inhalation: Vapors are unlikely due to physical properties. Dust may cause irritation of the upper respiratory tract (nose and throat) and lungs.

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Effects of Repeated Exposure: Contains component(s) which have been reported to cause effects on the following organs in animals: Blood. Kidney. Liver. The component(s) is/are: Trifluralin. **Cancer Information:** For the active ingredient(s): Oxyfluorfen. Has caused cancer in laboratory animals. An increase in nonmalignant liver tumors was observed with isoxaben in one of two species tested. A low incidence of urinary tract tumors was seen in only 1 of 5 chronic studies in rats with trifluralin. Trifluralin is not anticipated to be a carcinogenic risk to man. Crystalline silica has been shown to cause cancer in laboratory animals and humans.

Birth Defects/Developmental Effects: For the active ingredient(s): Trifluralin. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Component	CAS#	Amount
Trifluralin	1582-09-8	2.0 %
Oxyfluorfen	42874-03-3	0.3 %
Isoxaben	82558-50-7	0.3 %
Silica, crystalline (quartz)	14808-60-7	8.7 %
Balance		88.7 %

4. First-aid measures

Eye Contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Skin Contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly. **Inhalation:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Ingestion: Call a 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 control center or doctor. Never give anything by mouth to an unconscious person.

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. Fire Fighting Measures

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. This material does not burn. Fight fire for other material that is burning. Contain fire water run-off if

possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards:

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen fluoride. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Small spills: Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance.

Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not swallow. Avoid breathing dust or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Storage

Store in a dry place. Store in original container. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits Component List Value Type Silica, crystalline (quartz) **ACGIH** TWA 0.025 mg/m3 Respirable fraction. **Z**3 **TWA** 2.4 millions of particles per cubic Respirable. foot of air The exposure limit is calculated from the equation, 250/(%SiO2+5), using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits. **TWA Z**3 0.1 mg/m3 Respirable. The exposure limit is calculated from the equation, 10/(%SiO2+2), using a value of 100% SiO2. Lower percentages of SiO2 will yield higher exposure limits.

Z3 TWA Total 0.3 mg/m3

dust. The exposure limit is calculated from

the equation, 30/(%SiO2+2), using a value of 100% SiO2. Lower values of % SiO2 will give higher exposure

limits.

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Personal Protection

Eye/Face Protection: Use safety glasses. If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State Granules
Color Green
Odor Characteristic

Flash Point - Closed Cup
Flammable Limits In Air
Not applicable to solids
Lower: No test data available

Upper: No test data available

Autoignition Temperature No test data available **Vapor Pressure** No test data available **Boiling Point (760 mmHg)** No test data available. Vapor Density (air = 1) No test data available Specific Gravity (H2O = 1) No test data available Freezing Point No test data available **Melting Point** No test data available Solubility in Water (by No test data available

weight)

pH > 7.0 Literature

Decomposition Temperature

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Avoid direct sunlight or ultraviolet sources.

Incompatible Materials: Avoid contact with: Strong oxidizers. Strong acids.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides. Decomposition products can include trace amounts of: Hydrogen fluoride.

11. Toxicological Information

Acute Toxicity

Ingestion

Single dose oral LD50 has not been determined. Estimated LD50, Rat > 5,000 mg/kg

Skin Absorption

The dermal LD50 has not been determined. Estimated LD50, Rabbit > 5,000 mg/kg

Sensitization

Skin

For the active ingredient(s): Trifluralin. Has caused allergic skin reactions when tested in guinea pigs.

Repeated Dose Toxicity

Contains component(s) which have been reported to cause effects on the following organs in animals: Blood. Kidney. Liver. The component(s) is/are: Trifluralin.

Chronic Toxicity and Carcinogenicity

For the active ingredient(s): Oxyfluorfen. Has caused cancer in laboratory animals. An increase in nonmalignant liver tumors was observed with isoxaben in one of two species tested. A low incidence of urinary tract tumors was seen in only 1 of 5 chronic studies in rats with trifluralin. Trifluralin is not anticipated to be a carcinogenic risk to man. Crystalline silica has been shown to cause cancer in laboratory animals and humans.

Carcinogenicity Classifications:

Component	List	Classification
Silica, crystalline (quartz)	ACGIH	Suspected human carcinogen.; Group A2
	NTP	Known carcinogen.
	ACGIH	Suspected human carcinogen.; Group A2
	IARC	Human carcinogen.: 1

Developmental Toxicity

For the active ingredient(s). Trifluralin. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. For the active ingredient(s): Trifluralin. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

For the active ingredient(s): Trifluralin. In animal studies, did not interfere with reproduction.

Genetic Toxicology

The data presented are for the following material: Trifluralin. In vitro genetic toxicity studies were negative. The data presented are for the following material: Trifluralin. Animal genetic toxicity studies were predominantly negative.

12. Ecological Information

ENVIRONMENTAL FATE

Data for Component: Trifluralin

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is slight (Koc between 2000 and 5000). **Henry's Law Constant (H):** 1.03E-4 atm*m3/mole; 25 °C Estimated

Persistence and Degradability

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Indirect Photodegradation with OH Radicals

5.347 h Estima	ıted
5	5.347 h Estima

Stability in Water (1/2-life):

> 1 y; pH 3 - 9;Measured

0.19 - 3.08 h;Measured

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
5 %	28 d	OECD 301B Test

Data for Component: Oxyfluorfen

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Bioconcentration Factor (BCF): 184 - 1,151; bluegill (Lepomis macrochirus)

Persistence and Degradability

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Data for Component: Isoxaben

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is slight (Koc between 2000 and 5000).

Henry's Law Constant (H): 1.27E-09 atm*m3/mole; 25 °C Measured Partition coefficient, n-octanol/water (log Pow): 2.64 Measured

Partition coefficient, soil organic carbon/water (Koc): 2,927 Estimated

Persistence and Degradability

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. Biodegradation rate may increase in soil and/or water with acclimation.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
204.5E-12 cm3/s	0.628 h	Estimated

Stability in Water (1/2-life):

3.9 - 65.3 h; pH 7.0

Data for Component: Silica, crystalline (quartz)

Movement & Partitioning

Partitioning from water to n-octanol is not applicable.

Persistence and Degradability

Biodegradation is not applicable.

ECOTOXICITY

Data for Component: Trifluralin

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in most sensitive species). Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas), 96 h: 0.094 - 0.205 mg/l

LC50, bluegill (Lepomis macrochirus), 96 h: 0.0084 - 0.40 mg/l

LC50, rainbow trout (Oncorhynchus mykiss), 96 h: 0.025 - 0.10 mg/l

LC50, common carp (Cyprinus carpio), flow-through, 96 h: 0.089 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, static renewal, 24 h, immobilization: 0.13 - 0.56 mg/l

EC50, mussel Mytilus edulis, static, 48 h, immobilization: 0.096 mg/l

Aquatic Plant Toxicity

EC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), biomass growth inhibition, 5 d: 0.67 mg/l

EyC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), Dry weight, 72 h: 37 mg/l

Toxicity to Micro-organisms

EC50; activated sludge, respiration inhibition, 3 h: > 100 mg/l

Toxicity to Non-mammalian Terrestrial Species

dietary LC50, mallard (Anas platyrhynchos): > 5,000 ppm

oral LD50, bobwhite (Colinus virginianus): > 2,000 mg/kg

contact LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

oral LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: Oxyfluorfen

Material is highly toxic to fish on an acute basis (LC50 between 0.1 and 1.0 mg/L). Material is very highly toxic to aquatic invertebrates on an acute basis (LC50/EC50 < 0.1 mg/L). Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Chronic Toxicity Value (ChV):

ChV Value mg/l	Species	Test Type	Endpoint	Exposure Time
0.0018 mg/l	fathead minnow (Pimephales promelas)	flow-through	survival	33 d
0.0066 mg/l	fathead minnow (Pimephales promelas)	flow-through	survival	265 d
0.0065 mg/l	sheepshead minnow (Cyprinodon variegatus)	flow-through	growth	34 d

Toxicity to Non-mammalian Terrestrial Species

LD50, bobwhite (Colinus virginianus): > 2,150 ppm

LC50, mallard (Anas platyrhynchos): > 5,000 ppm

Data for Component: Isoxaben

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested). Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Fish Acute & Prolonged Toxicity

Product Name: SHOWCASE* Herbicide

LC50, bluegill (Lepomis macrochirus), static, 96 h: > 1.1 mg/l

LC50, sheepshead minnow (Cyprinodon variegatus), static, 96 h: > 0.87 mg/l

LC50, rainbow trout (Oncorhynchus mykiss), static, 96 h: 1.1 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, static, 48 h, immobilization: > 1.3 mg/l

LC50, grass shrimp (Palaemonetes pugio), static, 96 h: > 1.0 mg/l

Aquatic Plant Toxicity

EC50, duckweed Lemna sp., Growth inhibition (cell density reduction), 7 d: 0.013 mg/l NOEC, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), biomass growth inhibition, 14 d: > 1.4 mg/l

EC50, diatom Navicula sp., static, biomass growth inhibition, 72 h: > 86 mg/l

Fish Chronic Toxicity Value (ChV):

ChV Value mg/l	Species	Test Type	Endpoint	Exposure Time
> 0.40 mg/l	fathead minnow (Pimephales promelas)	static renewal	growth	33 d
> 0.42 mg/l	rainbow trout (Oncorhynchus mykiss)	static renewal	growth	66 d

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Aquatic Invertebrates Chronic Toxicity Value:

ChV Value mg/l	Species	Test Type	Endpoint	Exposure Time
0.85 mg/l	water flea Daphnia magna	static renewal	growth	21 d
48 mg/l	Midge (Chironomus riparius)	static	mortality	28 d

Toxicity to Non-mammalian Terrestrial Species

oral LD50, bobwhite (Colinus virginianus): > 2,000 mg/kg contact LD50, Honey bee (Apis mellifera): > 100 micrograms/bee oral LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, Earthworm Eisenia foetida, adult, 14 d: > 1,000 mg/kg

Data for Component: Silica, crystalline (quartz)

Not expected to be acutely toxic to aquatic organisms.

13. Disposal Considerations

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. Transport Information

DOT Non-Bulk

NOT REGULATED

DOT Bulk

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S

Technical Name: TRIFLURALIN

Hazard Class: 9 ID Number: UN 3077 Packing Group: PG III

IMDG

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S

Technical Name: TRIFLURALIN

Hazard Class: 9 ID Number: UN3077 Packing Group: PG III

EMS Number: F-A,S-F **Marine pollutant.: No**

ICAO/IATA NOT REGULATED

Additional Information

Reportable quantity: 500 lb - TRIFLURALIN

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health HazardYesDelayed (Chronic) Health HazardYesFire HazardNoReactive HazardNo

Sudden Release of Pressure Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS#	Amount
Trifluralin	1582-09-8	2.0%
Oxyfluorfen	42874-03-3	0.25%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS#	Amount
Trifluralin	1582-09-8	2.0%
Silica, crystalline (quartz)	14808-60-7	8.7%

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS#	Amount
Silica, crystalline (quartz)	14808-60-7	8.7%

Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

16. Other Information

Revision

Identification Number: 1000774 / 1016 / Issue Date 10/28/2008 / Version: 4.0 Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for
	activities such as exposure monitoring and medical surveillance if exceeded.

Dow AgroSciences LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.