

Material Safety Data Sheet

DOW AGROSCIENCES CANADA INC.

Product name: EDGE™ Herbicide

Issue Date: 02/02/2015

DOW AGROSCIENCES CANADA INC. 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: EDGE™ Herbicide

Recommended use of the chemical and restrictions on use

Identified uses: End use herbicide product

COMPANY IDENTIFICATION

DOW AGROSCIENCES CANADA INC.
2100 450 1ST STREET SW
CALGARY AB T2P 5H1
CANADA

For MSDS Updates and Product Information: 800-667-3852

Prepared by: Prepared for use in Canada by EH&S, Hazard Communications.

Revision Date: 02/02/2015

Customer Information Number:

800-667-3852 solutions@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 613-996-6666

Local Emergency Contact: 613-996-6666

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Physical state	Granules
Color	Yellow to green

Odor

Characteristic

Hazard Summary

WARNING!!

May cause allergic skin reaction.
May cause eye irritation.
May cause skin irritation.
May be harmful if inhaled.
Isolate area.
Keep upwind of spill.
Slipping hazard.
Highly toxic to fish and/or other aquatic organisms.
Cancer hazard.
Can cause cancer.

Potential Health Effects

Eyes: May cause slight eye irritation.
May cause slight corneal injury.
Solid or dust may cause irritation or corneal injury due to mechanical action.

Skin: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Prolonged contact may cause skin irritation with local redness.
May cause drying and flaking of the skin.
May cause thickening or hardening of the skin.
Effects may be delayed.
For the active ingredient(s):
Skin contact may cause an allergic skin reaction.

Inhalation: Inhalation is unlikely due to physical state.
Prolonged excessive exposure to dust may cause adverse effects.
Dust may cause irritation to upper respiratory tract (nose and throat).
Observations in animals include:
Incoordination.

Ingestion: Very low toxicity if swallowed.
Harmful effects not anticipated from swallowing small amounts.

Chronic Exposure: For the active ingredient(s):
In animals, effects have been reported on the following organs:
Liver.
An increase in benign mammary fibroadenomas was observed in female rats dosed with Ethalfuralin.
Has caused birth defects in laboratory animals only at doses toxic to the mother.
For the minor component(s):
In humans, effects have been reported on the following organs:
Kidney.
Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.
Has caused cancer in humans.
Has caused cancer in laboratory animals.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CASRN	Weight percent
Ethalfuralin	55283-68-6	5.0%
Limestone	1317-65-3	92.8%
Diatomaceous earth	61790-53-2	1.2%
Silica, crystalline (quartz)	14808-60-7	1.0%

4. FIRST AID MEASURES**Description of first aid measures**

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

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.

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.

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. Suitable emergency eye wash facility should be available in work area.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

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. Skin contact may aggravate preexisting dermatitis.

5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media: no data available

Special hazards arising from the substance or mixture

Hazardous combustion products: Fire conditions may cause this product to decompose. Refer to section 10 - Thermal Decomposition.

Unusual Fire and Explosion Hazards: no data available

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. 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). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. Refer to section 7, Handling, for additional precautionary measures. 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. Spills or discharge to natural waterways is likely to kill aquatic organisms.

Methods and materials for containment and cleaning up: 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. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing dust or mist. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe 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

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Ethalfuralin	Dow IHG	TWA	3 mg/m ³
Limestone	CA AB OEL	TWA	10 mg/m ³
	CA BC OEL	TWA	10 mg/m ³
	CA BC OEL	STEL	20 mg/m ³
	CA QC OEL	TWAEV total dust	10 mg/m ³
Diatomaceous earth	CA QC OEL	TWAEV total dust	6 mg/m ³
	CA BC OEL	TWA Respirable	1.5 mg/m ³
	CA BC OEL	TWA Total	4 mg/m ³
	CA ON OEL	TWA Inhalable fraction	10 mg/m ³
Silica, crystalline (quartz)	CA ON OEL	TWA Respirable fraction	3 mg/m ³
	ACGIH	TWA Respirable fraction	0.025 mg/m ³ , Silica
	CA AB OEL	TWA Respirable particulates	0.025 mg/m ³
	CA ON OEL	TWA Respirable fraction	0.1 mg/m ³

CA QC OEL	TWAEV respirable dust	0.1 mg/m3
CA BC OEL	TWA Respirable	0.025 mg/m3 , Silica

Consult local authorities for recommended 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.

Exposure controls

Engineering controls: 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.

Individual protection measures

Eye/face protection: Use chemical goggles.

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). 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.

Other 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.

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, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Granules
Color	Yellow to green
Odor	Characteristic
Odor Threshold	no data available
pH	6.5 (aqueous 10/90)
Melting point/range	No test data available
Freezing point	Not applicable
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup > 750 °C <i>Closed Cup</i>
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	no data available
Lower explosion limit	Not applicable

Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	Not applicable
Water solubility	Not applicable
Partition coefficient: n-octanol/water	no data available
Auto-ignition temperature	Not applicable
Decomposition temperature	No test data available
Dynamic Viscosity	Not applicable
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available
Liquid Density	Not applicable
Bulk density	961 - 1,041 kg/m ³
Molecular weight	no data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures.

Incompatible materials: None known.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined. Based on information for component(s): Estimated.

LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity

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

As product: The dermal LD50 has not been determined. Based on information for component(s): Estimated.
LD50, Rat, > 2,000 mg/kg Estimated.

Acute inhalation toxicity

Inhalation is unlikely due to physical state. Prolonged excessive exposure to dust may cause adverse effects. Dust may cause irritation to upper respiratory tract (nose and throat).
Observations in animals include: Incoordination.
As product: The LC50 has not been determined.

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness.
May cause drying and flaking of the skin.
May cause thickening or hardening of the skin.
Effects may be delayed.

Serious eye damage/eye irritation

May cause slight eye irritation.
May cause slight corneal injury.
Solid or dust may cause irritation or corneal injury due to mechanical action.

Sensitization

For the active ingredient(s):
Skin contact may cause an allergic skin reaction.
For the major component(s):
Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Available data are inadequate to determine single exposure specific target organ toxicity.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):
In animals, effects have been reported on the following organs:
Liver.
For the minor component(s):
In humans, effects have been reported on the following organs:
Kidney.
Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs.
For the major component(s):
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Carcinogenicity

For the active ingredient(s): An increase in benign mammary fibroadenomas was observed in female rats dosed with Ethalfuralin. Did not cause cancer in laboratory animals. For the minor component(s): Has caused cancer in humans. Has caused cancer in laboratory animals. For the major component(s): No relevant data found.

Teratogenicity

For the active ingredient(s): Has caused birth defects in laboratory animals only at doses toxic to the mother. For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity

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

For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Mutagenicity

For the major component(s): In vitro genetic toxicity studies were negative. For the active ingredient(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Ethalfuralin

Acute inhalation toxicity

Prolonged excessive exposure may cause adverse effects. Observations in animals include: Incoordination.

As product: LC50, Rat, 1 Hour, Dust, > 0.028 mg/l No deaths occurred at this concentration.

As product: LC50, Rat, male and female, 4 Hour, dust/mist, > 0.94 mg/l No deaths occurred at this concentration.

Limestone

Acute inhalation toxicity

Dust may cause irritation to upper respiratory tract (nose and throat).

Maximum attainable concentration. LC50, Rat, 4 Hour, dust/mist, > 3.0 mg/l No deaths occurred at this concentration.

Diatomaceous earth

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust.

For similar material(s): LC50, Rat, male and female, 4 Hour, Dust, > 0.69 mg/l No deaths occurred at this concentration.

Silica, crystalline (quartz)

Acute inhalation toxicity

Vapors are unlikely due to physical properties. Dust may cause irritation of the upper respiratory tract (nose and throat) and lungs. Excessive exposure may cause lung injury.

The LC50 has not been determined.

Carcinogenicity

Component

Silica, crystalline (quartz)

List

IARC

ACGIH

Classification

Group 1: Carcinogenic to humans

A2: Suspected human carcinogen

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

Ethalfuralin

Acute toxicity to fish

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 Hour, 0.054 - 0.102 mg/l, OECD Test Guideline 203 or Equivalent

LC50, Oncorhynchus mykiss (rainbow trout), flow-through test, 96 Hour, 0.136 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, eastern oyster (Crassostrea virginica), flow-through test, 96 Hour, 0.100 - 0.172 mg/l, OECD Test Guideline 202 or Equivalent

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 0.365 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 7 d, Growth rate inhibition, 0.004 - 0.0091 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, Oncorhynchus mykiss (rainbow trout), 50 d, 0.0004 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 0.0237 mg/l

Toxicity to Above Ground Organisms

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).

oral LD50, Colinus virginianus (Bobwhite quail), 14 d, > 2000mg/kg bodyweight.

dietary LC50, Colinus virginianus (Bobwhite quail), > 5000mg/kg diet.

oral LD50, Apis mellifera (bees), > 109.9micrograms/bee

contact LD50, Apis mellifera (bees), 46 - 100micrograms/bee

Toxicity to soil-dwelling organisms

LC50, Eisenia fetida (earthworms), 14 d, > 1,000 mg/kg

Limestone

Acute toxicity to fish

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).

LC50, Gambusia affinis (Mosquito fish), static test, 96 Hour, > 56,000 mg/l

Diatomaceous earth

Acute toxicity to fish

Based on information for a similar material:

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Silica, crystalline (quartz)

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

Persistence and degradability

Ethalfuralin

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

10-day Window: Fail

Biodegradation: 2 - 15 %

Exposure time: 28 d

Method: OECD Test Guideline 301F or Equivalent

Stability in Water (1/2-life)

Hydrolysis, pH 3, Stable

Hydrolysis, pH 6, Stable

Hydrolysis, pH 9, Stable

Photodegradation

Atmospheric half-life: 1.8 Hour

Method: Estimated.

Limestone

Biodegradability: Biodegradation is not applicable.

Diatomaceous earth

Biodegradability: Biodegradation is not applicable.

Silica, crystalline (quartz)

Biodegradability: Biodegradation is not applicable.

Bioaccumulative potential

Ethalfuralin

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

Partition coefficient: n-octanol/water(log Pow): 5.11 Measured

Bioconcentration factor (BCF): 1,330 Fish. Measured

Diatomaceous earth

Bioaccumulation: No relevant data found.

Silica, crystalline (quartz)

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Mobility in soil

Ethalfuralin

Expected to be relatively immobile in soil ($K_{oc} > 5000$).

Partition coefficient(K_{oc}): 4100 - 8400 Measured

Diatomaceous earth

No relevant data found.

Silica, crystalline (quartz)

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: 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

TDG

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Ethalfuralin)
UN number	UN 3077
Class	9
Packing group	III
Marine pollutant	Ethalfuralin

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(Ethalfuralin)
UN number	UN 3077
Class	9
Packing group	III
Marine pollutant	Ethalfuralin
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, solid, n.o.s.(Ethalfuralin)
UN number	UN 3077
Class	9
Packing group	III

Further information:

NOT REGULATED PER TDG EXEMPTION 1.45.1 FOR ROAD OR RAIL

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. 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

Hazardous Products Act Information: CPR Compliance

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Hazardous Products Act Information: WHMIS Classification

This product is exempt under WHMIS.

National Fire Code of Canada

Not applicable

Canadian Domestic Substances List (DSL) (DSL)

This product contains chemical substance(s) exempt from CEPA DSL Inventory requirements. It is regulated as a pesticide subject to Pest Control Products Act (PCPA) requirements.

Pest Control Products Act Registration Number: 20980

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Fire	Reactivity
1	0	0

Revision

Identification Number: 101198861 / A215 / Issue Date: 02/02/2015 / Version: 7.4

DAS Code: NAF-347

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
CA AB OEL	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	Canada. British Columbia OEL
CA ON OEL	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
CA QC OEL	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
Dow IHG	Dow Industrial Hygiene Guideline
STEL	short-term exposure limit
TWA	8-hour time weighted average
TWAEV	Time-weighted average exposure value

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES CANADA INC. 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.