Material Safety Data Sheet
Dow AgroSciences Canada Inc.

Product Name: Attain* XC B Herbicide **Issue Date:** 2010.12.28

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
Attain* XC B Herbicide

COMPANY IDENTIFICATION
Dow AgroSciences Canada Inc.
A Subsidiary of The Dow Chemical Company
Suite 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 2010.12.28

Customer Information Number: 800-667-3852
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 613-996-6666
Local Emergency Contact: 613-996-6666

2. Hazards Identification

Emergency Overview
Color: Yellow
Physical State: Liquid
Odor: Characteristic
Hazards of product:

WARNING! May cause allergic skin reaction. May cause eye irritation. May be harmful if swallowed. Isolate area. Toxic fumes may be released in fire situations.

Potential Health Effects

Eye Contact: May cause slight eye irritation. May cause slight temporary corneal injury.
Skin Contact: Brief contact may cause slight skin irritation with local redness. May cause drying and flaking of the skin.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: As product: Has demonstrated the potential for contact allergy in mice.
Inhalation: No adverse effects are anticipated from single exposure to mist.
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. Swallowing may result in gastrointestinal irritation.
Effects of Repeated Exposure: For the minor component(s): 2-Ethylhexanol In animals, effects have been reported on the following organs: Blood. Kidney. Liver. Spleen.
Birth Defects/Developmental Effects: For the active ingredient(s): Has been toxic to the fetus in lab animals at doses nontoxic to the mother. For the minor component(s): Excessive ingestion of 2-ethylhexanol caused birth defects in laboratory animals only at doses toxic to the mother. Occupational exposure to 2-ethylhexanol by the inhalation or dermal routes poses no significant threat to the offspring. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Reproductive Effects: For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.

3. Composition/information on ingredients

Component	CAS #	Amount W/W
2,4-D 2-ethylhexyl ester	1928-43-4	87.2 %
Benzenesulfonic acid, dodecyl-, calcium salt	26264-06-2	3.0 %
2-Ethylhexanol	104-76-7	1.0 %
Balance		8.8 %

Amounts are presented as percentages by weight.

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. Move person to fresh air; if effects occur, consult a physician.
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. Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
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. If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

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), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

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. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function. Water fog, applied gently may be used as a blanket for fire extinguishment.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrogen chloride. Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. 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.

See Section 9 for related Physical Properties

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. 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.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. 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

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

Storage
Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
2,4-D 2-ethylhexyl ester	CAD BC OEL	TWA	10 mg/m3
	CAD BC OEL	STEL	20 mg/m3
	CAD ON OEL	TWAEV as 2,4-D	10 mg/m3

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.

Personal Protection
Eye/Face Protection: Use safety glasses (with side shields).
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. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Avoid gloves made of: Viton. 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. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying 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 local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid
Color	Yellow
Odor	Characteristic
Odor Threshold	No test data available
pH	3.91 (@ 1 %) *pH Electrode* (1% aqueous suspension)
Melting Point	Not applicable
Freezing Point	No test data available
Boiling Point (760 mmHg)	No test data available.
Flash Point - Closed Cup	136 °C *Pensky-Martens Closed Cup ASTM D 93*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammable Limits In Air	**Lower**: No test data available **Upper**: No test data available
Vapor Pressure	No test data available
Vapor Density (air = 1)	Not applicable
Specific Gravity (H2O = 1)	1.1402 20 °C/4 °C *Digital Density Meter (Oscillating Coil)*
Solubility in water (by weight)	emulsifiable
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Autoignition Temperature	273 °C *Literature* Ramped Temperature
Decomposition Temperature	No test data available
Dynamic Viscosity	28.8 mPa.s @ 20 °C
Kinematic Viscosity	30.2 cSt @ 20 °C
Liquid Density	1.14 g/cm3 @ 20 °C *Digital density meter*

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.

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

Possibility of hazardous reactions
Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

Incompatible Materials: Avoid contact with: Acids. Bases. Oxidizers.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride.

11. Toxicological Information

Acute Toxicity
Ingestion
As product: LD50, Rat, female 1,750 mg/kg
Dermal
As product: LD50, Rat > 5,000 mg/kg
No deaths occurred at this concentration.
Inhalation
As product: LC50, 4 h, Aerosol, Rat > 5.16 mg/l
No deaths occurred at this concentration.

Eye damage/eye irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Skin corrosion/irritation
Brief contact may cause slight skin irritation with local redness. May cause drying and flaking of the skin.

Sensitization
Skin
As product: Has demonstrated the potential for contact allergy in mice.

Repeated Dose Toxicity
For the active ingredient(s): Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects. For the minor component(s): 2-Ethylhexanol In animals, effects have been reported on the following organs: Blood. Kidney. Liver. Spleen.

Chronic Toxicity and Carcinogenicity
For the active ingredient(s): Did not cause cancer in laboratory animals.

Developmental Toxicity
For the active ingredient(s): Has been toxic to the fetus in lab animals at doses nontoxic to the mother. For the active ingredient(s): Did not cause birth defects in laboratory animals. For the minor component(s): Excessive ingestion of 2-ethylhexanol caused birth defects in laboratory animals only at doses toxic to the mother. Occupational exposure to 2-ethylhexanol by the inhalation or dermal routes poses no significant threat to the offspring. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive Toxicity
As product: No relevant information found. For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.

Genetic Toxicology
For the active ingredient(s): In vitro genetic toxicity studies were negative.

12. Ecological Information

Toxicity

Data for Component: **2,4-D 2-ethylhexyl ester**

Material is moderately toxic to fish on an acute basis (LC50 between 1 and 10 mg/L). Material is slightly toxic to aquatic invertebrates on an acute basis (LC50/EC50 between 10 and 100 mg/L). Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Acute & Prolonged Toxicity

As the ester active substance. LC50, tidewater silverside (Menidia beryllina), flow-through, 96 h: > 0.24 mg/l

As the ester active substance. LC50, rainbow trout (Oncorhynchus mykiss), 96 h: > 5.0 mg/l

As the ester active substance. LC50, fathead minnow (Pimephales promelas), 96 h: > 5.0 mg/l

Aquatic Invertebrate Acute Toxicity

As the ester active substance. EC50, water flea Daphnia magna, static, 96 h, survival: > 1.91 mg/l

As the ester active substance. LC50, water flea Daphnia magna, static, 48 h, survival: 18.7 mg/l

Aquatic Plant Toxicity

As the ester active substance. EbC50, diatom Skeletonema costatum, static, biomass growth inhibition, 5 d: 0.23 mg/l

As the ester active substance. EC50, duckweed Lemna sp., static renewal, Number of fronds, 14 d: 0.5 mg/l

Toxicity to Above Ground Organisms

oral LD50, mallard (Anas platyrhynchos)

dietary LC50, mallard (Anas platyrhynchos)

oral LD50, Honey bee (Apis mellifera)

contact LD50, Honey bee (Apis mellifera)

Data for Component: **Benzenesulfonic acid, dodecyl-, calcium salt**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, common carp (Cyprinus carpio), 96 h: 2.8 - 4.2 mg/l

LC50, Japanese medaka (Oryzias latipes), 48 h: 3.0 - 5.3 mg/l

Data for Component: **2-Ethylhexanol**

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (Oncorhynchus mykiss), 96 h: 32 - 37 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea Daphnia magna, 48 h, lethality: 35.2 mg/l

Aquatic Plant Toxicity

EC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), Growth rate inhibition, 72 h: 11.5 mg/l

Toxicity to Micro-organisms

EC50; bacteria, 16 h: 256 - 320 mg/l

Persistence and Degradability

Data for Component: **2,4-D 2-ethylhexyl ester**

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%). Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Stability in Water (1/2-life):
48.3 d; 25 °C; pH 7

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
77 %	29 d	OECD 301B Test	fail

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
0.84 %	0.92 %	1.32 %	

Theoretical Oxygen Demand: 1.87 mg/g

Data for Component: **Benzenesulfonic acid, dodecyl-, calcium salt**

No relevant data found.

OECD Biodegradation Tests: For similar material(s):

Biodegradation	Exposure Time	Method	10 Day Window
95 %	28 d	OECD 301E Test	pass

Data for Component: **2-Ethylhexanol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
68 %	17 d	OECD 301B Test	pass
> 95 %	5 d	OECD 302B Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.32E-11 cm3/s	9.7 h	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
26 - 70 %	75 - 81 %	86 - 87 %	

Chemical Oxygen Demand: 2.70 mg/mg
Theoretical Oxygen Demand: 2.95 mg/mg

Bioaccumulative potential

Data for Component: **2,4-D 2-ethylhexyl ester**

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).

Partition coefficient, n-octanol/water (log Pow): 5.78 Measured

Data for Component: **Benzenesulfonic acid, dodecyl-, calcium salt**

Bioaccumulation: No relevant data found.

Data for Component: **2-Ethylhexanol**

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

Partition coefficient, n-octanol/water (log Pow): 3.1 Measured

Mobility in soil

Data for Component: **2,4-D 2-ethylhexyl ester**

Mobility in soil: No relevant data found.

Partition coefficient, soil organic carbon/water (Koc): 25,000 - 68,000 Estimated.

Henry's Law Constant (H): 4.4E-05 atm*m3/mole; 25 °C Estimated.

Data for Component: **Benzenesulfonic acid, dodecyl-, calcium salt**

Mobility in soil: No relevant data found.

Data for Component: **2-Ethylhexanol**

Mobility in soil: Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient, soil organic carbon/water (Koc): 800 Estimated.

Henry's Law Constant (H): 2.49E-05 atm*m3/mole Estimated.

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

TDG Small container
NOT REGULATED

TDG Large container
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

15. Regulatory Information

CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

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.

Pest Control Products Act Registration number: 29972

National Fire Code of Canada
Not applicable

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	1	0

Recommended Uses and Restrictions
End use herbicide product

Revision

Identification Number: 1009103 / 1023 / Issue Date 2010.12.28 / Version: 1.1
DAS Code: GF-1406
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
VOL/VOL	Volume/Volume

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.