Achieve® Liquid Gold is a co-pack of Achieve Liquid, Buctril® M and Turbocharge Adjuvant.

The Achieve Liquid MSDS, Turbocharge MSDS, and Buctril M MSDS follow.
SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

a. **Product Identifier:** ACHIEVE® Liquid Herbicide  
   Registration Number: 27011  
   Formulation Number: A13003J  
   Chemical Class: Cyclohexandione herbicide  
   Synonym: None

b. **Name of Supplier, Address and Emergency Telephone Number:** See above.

c. **Name of Manufacturer, Address and Emergency Telephone Number:** See above.

d. **Product Use:** ACHIEVE is a suspension concentrate herbicide for post emergence control of annual grasses in small grain cereals.

e. **Date of MSDS Preparation:** 05-03-10

f. **Name and Telephone Number of Party Responsible for MSDS Preparation:** Prepared by Regulatory & Biology Development Department of Syngenta Crop Protection Canada, Inc. For further information, please contact 1-87S-YNGENTA (1-877-964-3682)

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

a. **Chemical Identity and CAS Registry No. of hazardous ingredients (WHMIS Controlled Products) present at 1.0%, or 0.1% as appropriate, by weight.** None

b. **Ingredients present which are on the WHMIS Ingredient Disclosure List at, or above, the minimum concentration specified on the List:** None

c. **Ingredients with unknown toxicological properties:** None

d. **Ingredients the supplier believes may be harmful:** None

e. **PIN (Transport Canada - Product Identification Number) for the entire product:** Not applicable

f. **Generic chemical identity and Registry Number for trade secret ingredients registered under the Hazardous Materials Information Review Commission:** None

g. **Ingredient concentration in units of wt./wt., vol./vol. or wt./vol. expressed as:**
   i) actual concentration, or ii) a range as specified in the Controlled Product Regulations.
   Tralkoxydim, CAS No. 87820-88-0 35% w/w

h. **Exposure limits for ingredients:** Tralkoxydim 3mg/m³ TWA (Syngenta Occupational Exposure Limit- OEL)

SECTION 3 HAZARDS IDENTIFICATION

**Symptoms of Acute Exposure:** Harmful if inhaled or swallowed. Dust, mist or vapour irritating to eyes and respiratory tract. May cause skin irritation.

**Hazardous Decomposition Products:** Can decompose at high temperatures forming toxic gases.
**Unusual Fire, explosion and Reactivity Hazards:** During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

**Potential Health Effects:**

a. **Relevant routes of exposure:** Skin, eyes

b. **Adverse health effects from exposure to product or ingredients of product:**
   i) length of exposure
   ii) severity of effect
   iii) target organ
   iv) type of effect
   v) signs and symptoms

A mild eye and skin irritant.

**Medical conditions known to be aggravated:** None known

---

**SECTION 4 FIRST AID MEASURES**

If POISONING IS SUSPECTED, immediately contact the poison information centre, doctor or nearest hospital. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given. Call the Syngenta Emergency Line [1-800-327-8633 (1-800-FASTMED)], for further information.

**EYE CONTACT:** Immediately flush eyes repeatedly with large amounts of clean, running water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Hold eyelids apart to rinse the entire surface of the eyes and lids. Do not apply any medicating agents except on the advice of a physician.

**SKIN CONTACT:** Remove contaminated clothing. Using plenty of soap and water, wash then rinse skin, hair and under fingernails for 15-20 minutes. Do not apply any medicating agents except on the advice of a physician. Obtain medical attention if irritation persists.

**INHALATION:** Move person from contaminated area to fresh air. If the individual is not breathing, call 911 or an ambulance and begin artificial respiration.

**INGESTION:** If victim is fully conscious, have the person sip a glass of water if able to swallow. Do not induce vomiting unless instructed to do so by the Syngenta Emergency Line (1-800-327-8633) or a physician. Never give anything by mouth, or attempt to induce vomiting, in an unconscious or convulsing person.

**NOTE TO PHYSICIAN:** There is no specific antidote if this product is ingested. Treat symptomatically

---

**SECTION 5 FIRE FIGHTING MEASURES**

1. **Flash point and method:** >200°F
2. **Upper and lower flammable (explosive) limits in air:** Not applicable
3. **Autoignition temperature:** Not available.
4. **Flammability:** Not flammable
5. **Conditions under which flammability could occur:** Not applicable
6. **Sensitivity to explosion by mechanical impact:** Not available.
7. **Sensitivity to explosion by static discharge:** Not available.
8. **Unusual Fire, explosion and Reactivity Hazards:** During a fire, irritating and possible toxic gases may be generated by thermal decomposition or combustion.
9. **In case of fire:** Use dry chemical, foam or CO₂ extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent
human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

SECTION 6   ACCIDENTAL RELEASE MEASURES

a. **Procedures for dealing with release or spill:**
Control the spill at its source. Contain the spill to prevent it from spreading, contaminating soil, or entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. If a solid, sweep up material and place in a compatible disposal container. If a liquid, cover entire spill with absorbing material and place into a compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic & Span, etc.). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition. Follow provincial guidelines for waste disposal.

SECTION 7   HANDLING AND STORAGE

a. **Handling practices:** Store material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling. Always wash thoroughly after handling. Remove contaminated clothing promptly, and wash it before wearing again. Wear personal protective equipment (see Section 8) when applying ACHIEVE Liquid.

SECTION 8   EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

Ingestion: Do not eat, drink, use tobacco or apply cosmetics in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

Eye Contact: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Skin Contact: Where contact is likely, wear chemical-resistant (such as nitrile or butyl) gloves, coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

Inhalation: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P or R 95 or HE class filter and an organic vapour cartridge may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a pressure demand atmosphere-supplying respirator if there is any potential for uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

FOR COMMERCIAL APPLICATIONS AND ON-FARM APPLICATIONS
Wear chemically resistant gloves (nitrile), safety goggles, boots and coveralls when mixing, loading, and during clean up or when adjusting or repairing sprayer. Do not eat, drink, use tobacco or apply cosmetics in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling. Launder contaminated clothing prior to re-use.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Beige liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>pH</td>
<td>6.1 (neat)</td>
</tr>
<tr>
<td>Vapour pressure and reference temperature</td>
<td>4 x 10e-10 mmHg @ 22°C (72°F) (Tralkoxydim).</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-18°C</td>
</tr>
<tr>
<td>Density</td>
<td>1.16 g/mL @ 20°C</td>
</tr>
<tr>
<td>Water/oil partition coefficient</td>
<td>Not available</td>
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<tr>
<td>Viscosity</td>
<td>884 cps @ 20°C</td>
</tr>
<tr>
<td>Solubility in H2O</td>
<td>Tralkoxydim: 7 mg/L</td>
</tr>
</tbody>
</table>

SECTION 10 STABILITY AND REACTIVITY

a. Chemical stability: Stable under normal use and storage conditions
b. Conditions to avoid: None known.
c. Hazardous decomposition products: Can decompose at high temperatures, forming toxic gases.
d. Materials to avoid: None known.
e. Hazardous polymerisation: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

a. LD50 (species and route)
   Oral (LD50 rat): >=2, 950 mg/kg body weight slightly toxic
   Dermal (LD50 rat): >5, 000 mg/kg body weight practically non-toxic
   LC50 (species)
   Inhalation (LC50 rat): > 9.52 mg/L air (4 hour) practically non-toxic
b. Irritation data
   Primary eye irritation (rabbit): mildly irritating
   Primary skin irritation (rabbit): slightly irritating

c. Results of studies on:
   Sensitization
   Dermal sensitisation: not a dermal sensitizer
   Neurotoxicity
   Tralkoxydim: No evidence of neurotoxic effects from the toxicity database. No specific neurotoxicity tests have been preformed
   Carcinogenicity
Tralkoxydim: No evidence of carcinogenic effects in hamster studies. However, the EPA has classified tralkoxydim as a likely human carcinogen based on a) increased Leydig cell tumours in a rat study, b) no data to support a mechanism for tumours that is not relevant to man, and c) inadequate second species. New data in a second species is currently under review.

Reproductive toxicity
Tralkoxydim: No evidence of reproductive toxicity at any level in rabbit tests. No evidence of genotoxicity in Ames, L5178Y, mouse micronucleus and USD assays.

Chronic/Subchronic exposure:
Tralkoxydim: Rat studies have shown effects on the liver and the retina; and the Leydig cell hyperplasia development of testicular and benign tumours at a dose of 2500 ppm. Lifetime hamster studies showed a decreased lymphocyte level and increased liver pigment at 2500 ppm and above.
A 90-day dog study showed signs of minor hepatotoxicity at 5 mg/kg/day (increased liver weights and enzyme changes).

d. Toxicity of Other Components:
Not applicable

Target organs:

<table>
<thead>
<tr>
<th>Active Ingredients</th>
<th>Tralkoxydim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert Ingredients</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>- Liver, eye, testicle</td>
</tr>
</tbody>
</table>

SECTION 12 ECOLOGICAL INFORMATION

Summary of Effects: Tralkoxydim showed no toxicity to fish, birds, insects, arthropods, earthworms, or aquatic invertebrates, and no potential for accumulation in organisms. The potential harm to sensitive nontarget plant species can be avoided by following the product label precautions.

a. Eco-Acute Toxicity
   Acute (LC50, 96 hour): Bluegill Sunfish > 6.1 mg/L
   Acute (LC50, 96 hour): Rainbow Trout > 7.2 mg/L
   Acute (LC50, 96 hour): Mirror Carp > 8.2 mg/L
   Acute (EC50): Daphnia magna > 175 mg/L
   Acute (EC50, 5-day): Green Algae 5.1 mg/L
   Oral (LD50): Mallard > 3,020 mg/kg
   Acute (LC50, 5-day): Mallard Ducks > 7,400 mg/kg
   Acute (LC50, 5-day): Bobwhite Quail 6,237 mg/kg

b. Eco-Chronic Toxicity
   28-day LC50 Trout NOEC 4.6 mg/L
   Dietary Reproduction Mallard > 150 ppm in feed
   Dietary Reproduction Bobwhite Quail > 150 ppm in feed

c. Environmental Fate
   The information available from the active ingredient studies and from field studies done with a 50% dry flowable formulation indicates that the soil half life of tralkoxydim applied as Achieve SC is expected be very short, approximately of 1-2 days. The active ingredient is not volatile and is not persistent in water.

   Under laboratory conditions, tralkoxydim degrades rapidly in soil; typical DT50 = 2-5 d (aerobic), or 3 weeks (anaerobic flooded soil). Primary metabolites are also extensively degraded; within 30 days, up to 44% of applied radioactivity is liberated as CO₂. Degradation is primarily microbial, but
soil surface photolysis, aqueous photolysis and hydrolysis all occur. The Koc of 30-300 predicts relatively strong binding; however, rapid degradation ensures that there is no significant movement of either tralkoxydim or its degradates down the soil profile.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste disposal information:
Do not reuse product containers. Dispose of used containers, unwanted product and residues in accordance with local environmental regulations. Do not allow contamination of any body of water. If in doubt, consult the Provincial Ministry of Environment. Industrial/commercial waste can only be handled by licensed facilities. Waste shipments must be securely packed and properly labelled. Only licensed carriers can be used and proper documents must accompany the shipment.

SECTION 14 TRANSPORT INFORMATION

Transportation of Dangerous Goods Classification (Road): Not regulated.

SECTION 15 REGULATORY INFORMATION

WHMIS classification for product: Exempt.
This MSDS has been prepared in accordance with WHMIS requirements, but the data are presented under 16 headings.

SECTION 16 OTHER INFORMATION

The information and recommendations contained herein are based on information believed to be correct. However, no guarantee or warranty of any kind, expressed or implied is made with respect to the information provided herein.

© Registered trademark of a Syngenta group company
Section 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company: Syngenta Crop Protection Canada, Inc.
140 Research Lane
Guelph, ON
N1G 4Z3

Phone number: (519) 836-5665
Emergency phone: 1-800-327-8633 (1-800-FASTMED)

Name used on label: TURBOCHARGE
Product use: An agricultural adjuvant.

A Registered Trade Mark of a Syngenta Group Company.

Section 2 – COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Identity</th>
<th>CAS-no.</th>
<th>Typical %</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Hydrocarbon Oil</td>
<td>64741-88-4</td>
<td>50 %</td>
<td></td>
</tr>
<tr>
<td>Emulsifier Blend</td>
<td></td>
<td>40 %</td>
<td></td>
</tr>
<tr>
<td>Low MW Alcohol Solvent</td>
<td></td>
<td>0 .. 10 %</td>
<td></td>
</tr>
</tbody>
</table>

Ingredients not precisely identified are proprietary or non hazardous. Values are not product specifications.

Section 3 – HAZARDS IDENTIFICATION

Physical hazards:
None

Health hazards:
Irritant (skin, eye, respiratory passages)
MATERIAL SAFETY DATA SHEET

TURBOCHARGE

Section 4 – FIRST AID MEASURES

IF IN EYES:
Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention immediately.

IF ON SKIN:
Flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention immediately.

IF SWALLOWED:
Provided the patient is conscious, wash out mouth with water. Immediately contact Syngenta's Emergency Information Network at 1-800-F-A-S-T-M-E-D (327-8633). Do not induce vomiting. Vomiting should only be induced under the direction of a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water. Obtain immediate medical attention.

IF INHALED:
Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is labored, give oxygen. Obtain immediate medical attention.

MEDICAL ADVICE:
Lavage is indicated for the unresponsive patient who has ingested a large dose. Hydrocarbon pneumonitis is a risk if this product is aspirated. Apply artificial respiration if breathing has ceased or shows signs of failing.

Section 5 – FIRE FIGHTING MEASURES

Flash point:
> 100 °C
Method: TCC
Autoignition temperature:
Not available.
Flammable limits (STP):
Not available.
Flammable limits (LEL):
Not available.
Explosive properties:
EXTINGUISHING MEDIA:
For small fires, use carbon dioxide, dry powder or halon extinguishant. For large fires, use foam or water-fog; avoid use of water jet. Water spray may be ineffective as an extinguishing medium but may be used to cool fire-exposed containers and to flush non-ignited spills or vapors away from sources of ignition. Contain run-off water with, for example, temporary earth barriers.

FIRE AND EXPLOSION HAZARDS:
Keep fire exposed containers cool by spraying with water.

PROTECTIVE EQUIPMENT:
A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.

Unusual fire and explosion hazards:
Heavy vapors can flow along surfaces to distant ignition sources and flash back.

Section 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Wear suitable protective clothing and eye protection to prevent skin and eye contact. Use adequate ventilation and wear an air-supplied respirator to prevent inhalation.

ENVIRONMENTAL PRECAUTIONS:
Washings must be prevented from entering surface water drains.

ADDITIONAL INFORMATION:
1. Spread a suitable absorbent such as clay on the spill, and shovel into an open drum.
2. Generously cover the contaminated areas with common, household detergent (e.g. TIDE, registered trademark of Proctor and Gamble Co.). Using a stiff brush and small amounts of water, work the detergent into the remaining spilled material forming a slurry. Brush the slurry into cracks and crevices and allow to stand for 2-3 minutes. Be careful to completely avoid skin or eye contact. Do not splatter on oneself or bystanders.
3. Spread absorbent on the slurry liquid and shovel mixture into the open drum.
4. Repeat #2 and 3 if necessary.
5. Rinse with a small amount of water and use absorbent to collect the wash solution. Shovel into the drum.
6. Seal drum and dispose of contaminated material in a facility permitted for hazardous waste. Large spills should be handled according to spill plan. Otherwise, in case of emergency call, day or night, 613-996-6666,
Section 7 – HANDLING AND STORAGE

SAFE HANDLING ADVICE:
Keep container tightly closed, in a cool, well-ventilated place. Keep away from heat.

REQUIREMENTS FOR STORAGE ROOMS:
Do not expose sealed containers to temperatures above 50 Deg. C. Do not breathe mist. Avoid contact with skin and eyes. After contact with skin, wash immediately with plenty of soap and water.

ADDITIONAL INFORMATION:
Do not store near feed, food, or within the reach of children.

Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

**Occupational exposure limits**
ACGIH TLV Petroleum Hydrocarbon Oil
- Particulates
  - ACGIH TLV 5 mg/m³

ENGINEERING CONTROLS:
Local exhaust ventilation preferred. General exhaust is acceptable.

EYE PROTECTION:
Chemical tight goggles; full faceshield in addition if splashing is possible.

BODY PROTECTION:
Protective clothing as needed, impervious gloves, apron and arm covers. User should verify impermeability under normal conditions of use prior to general use.

RESPIRATORY PROTECTION:
If needed, use MSHA-NIOSH approved respirator for pesticides.

Other protective equipment:
Eyewash station and safety shower in work area
Refer to product labeling for specific end-use requirements.

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

- **Form**: liquid
- **Color**: pale yellow
- **Odor**: mild
Boiling point : Not available.
               (greater than 100)
Melting point : approx −5 °C
Freezing temperature : approx −10 °C
Vapor Pressure : Not available.
Evaporation Rate : Not available.
Vapour density : No data, heavier than air
                 (air = 1)
Specific gravity : 0.87 .. 0.88
                 at 20 °C
                 (water = 1)
Bulk density : Not applicable
Solubility : Emulsifiable
pH-value (quant.) : 6.5
                  1% w/v suspension
Partition coeff. : Water/Oil Distribution
                 Not available.
Threshold odour : Not available.
Volatile by volume: Not available
Sensitivity to : Mechanical Impact: Not available
Mechanical Impact: Not available
Burning time : Not available
Explosive properties : Not applicable
Discharge Rate : Not available

Section 10 – STABILITY AND REACTIVITY

HAZARDOUS REACTIONS (CONDITIONS TO AVOID)
Stability:
   Stable under normal conditions. Can be made to burn under fire conditions.
Conditions to avoid:
   Storage above 40 Deg. C., sources of ignition.
   Hazardous polymerization:
   Will not occur.
HAZARDOUS REACTIONS (MATERIALS TO AVOID)
   Incompatible materials: strong oxidising agents
HAZARDOUS DECOMPOSITION PRODUCTS
   Combustion products - Carbon dioxide, carbon monoxide.
Section 11 – TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (LETHAL DOSES)

LD50 Ingestion rat
Dose : > 5000 mg/kg
Additional inform. : This material is classified as "practically nontoxic" by ingestion. Ingestion of large amounts may cause nausea, gastrointestinal upset and abdominal pain. May cause central nervous system (CNS) depression, peripheral nervous system (PNS) effects, damage to the blood-forming tissues and accelerated heart rate.

LD50 Dermal rabbit
Dose : > 2000 mg/kg
Additional inform. : This material can irritate the skin.
May cause defatting, drying and cracking of the skin.
May be absorbed through intact skin. May cause central nervous system (CNS) depression, peripheral nervous system (PNS) effects, damage to the blood-forming tissues and accelerated heart rate.

Inhalation
Additional inform. : Product is irritating to the nose, throat and respiratory tract. May cause coughing and sneezing, central nervous system (CNS) depression, peripheral nervous system (PNS) effects, damage to the blood-forming tissues and accelerated heart rate.

ACUTE TOXICITY (IRRITATION, SENSITIZATION ETC.)

Eye Irritation
Results : IRRITANT

GENERAL INFORMATION ABOUT ACUTE OR OTHER TOXICITIES

Other effects of overexposure:
CNS depression is characterized by headache, dizziness, drowsiness, nausea vomiting and incoordination. Severe overexposure may lead to coma and possible death due to respiratory failure.
Peripheral neuropathy is a progressive disorder of the nervous system characterized by sensory and motor abnormalities, muscle spasms, weakness and pain in the arms and legs, numbness and tingling of the fingers and toes and paralysis.
No toxicity information is available on this specific preparation; this health hazard assessment is based on information that is available on
similar preparations.

General information
The ingredient(s) of this product is (are) not classified as carcinogenic by ACGIH or IARC, not regulated as carcinogens by OSHA and not listed as carcinogens by NTP.
No information is available and no adverse reproductive or mutagenic effects are anticipated. There is also no information available and no adverse teratogenic/embryotoxic effects are anticipated.

Section 12 – ECOLOGICAL INFORMATION

ADDITIONAL INFORMATION ABOUT ECOLOGY
This material is toxic to fish and wildlife.

Section 13 – DISPOSAL CONSIDERATIONS

Disposal Method:
Do not contaminate waterways by cleaning of equipment or by disposal of wastes. Untreated effluent should not be discharged where it will drain into lakes, streams, or ponds.
Container disposal:
Empty container retains product residue. Observe all hazard precautions. Do not distribute or make available, furnish or reuse empty container except for storage and shipment of original product. Remove all product residue from container and puncture or otherwise destroy empty container before disposal.

Section 14 – TRANSPORT INFORMATION

TRANSPORT/ADDITIONAL INFORMATION
Road (TDG) transport:
Not Regulated By TDG

Section 15 – REGULATORY INFORMATION

Other regulations, restrictions and prohibitions
Pest Control Products (PCP) Act Registration No.: 23135
Section 16 – OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Syngenta will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years. This product is under the jurisdiction of the Pest Control Products Act and is exempt from the requirements for a WHMIS compliant MSDS. Hazardous properties of all ingredients have been considered in the preparation of this MSDS. Read the entire MSDS for the complete hazard evaluation of this product.

A vertical var (|) in the left margin indicates an amendment from the previous version.
SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: BUCTRIL M
Chemical Name: BUCTRIL M
Synonym: BUCTRIL M
MSDS Number: 272
Chemical Family:
Chemical Formulation:
EPA Registration No.: 18022
Canadian Registrat. No.: 18022

Bayer CropScience Inc
#100 - 3131 - 114th Avenue SE
Calgary, AB T2Z 3X2
Canada


Product Use Description: Herbicide

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS No.</th>
<th>Concentration % by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BROMOXYNIL OCTANOATE</td>
<td>1689-99-2</td>
<td>&gt;= 10.0000 &lt;= 30.0000</td>
</tr>
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<td>MCPA 2-Ethyl Hexyl Ester</td>
<td>29450-45-1</td>
<td>&gt;= 30.0000 &lt;= 60.0000</td>
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<td>BROMOXYNIL HEPTANOATE</td>
<td>56634-95-8</td>
<td>&gt;= 10.0000 &lt;= 30.0000</td>
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</table>

SECTION 3. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview: Harmful if absorbed through the skin. Harmful if inhaled. Harmful if swallowed. Caution: Combustible.

Physical State: liquid

Odor: AROMATIC SOLVENT


Immediate Effects
  Eye: Causes severe eye irritation.
Skin
Causes moderate skin irritation. Harmful if absorbed through the skin.

Ingestion
May be fatal if swallowed. May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation and central nervous system depression. Aspiration can be a hazard if this material is swallowed.

Inhalation
Excessive inhalation causes headache, dizziness, nausea and incoordination. May be harmful if inhaled.

Chronic or Delayed Long-Term
Dermatitis
CARCINOGENIC:
The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, limited evidence for carcinogenicity in humans.
TERATOGENIC:
EPA has classified bromoxynil as a class C oncogen. Based upon the results of rat and rabbit teratogenicity studies, bromoxynil phenol is considered to be a developmental toxicant. Women of childbearing age should be particularly careful when handling this product to avoid ingestion and skin contact. This product contains bromoxynil ester.

Medical Conditions Aggravated by Exposure
Central nervous system disorders. Liver, kidney. Repeated overexposure to phenoxy herbicides may cause liver, kidney, gastrointestinal and muscular effects. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods.

SECTION 4. FIRST AID MEASURES

Eye
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

Ingestion
Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Note to Physician
No specific antidote. Treatment based on sound judgment of physician and individual reactions of patient.
### SECTION 5. FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>63 °C / 145 °F</td>
</tr>
<tr>
<td>Auto Ignition Temperature</td>
<td>443 °C / 829 °F</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>7 % (V)</td>
</tr>
<tr>
<td>Suitable Extinguishing Media</td>
<td>Carbon Dioxide, Dry Chemicals, Foam Water fog, carbon dioxide, foam, dry chemical.</td>
</tr>
</tbody>
</table>

#### Fire Fighting Instructions
Containers can build up pressure if exposed to heat (fire). Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

#### Dust Explosion Class
SENSIVITY TO MECHANICAL IMPACT (Y/N): NO
SENSIVITY TO STATIC DISCHARGE: Sensitivity to static discharge is expected; material has a flash point below 93°C.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

**Land Spill or Leaks**
Remove sources of ignition. Absorb spills on inert material such as perlite, vermiculite, sand or dirt, then wet with water. Place in double polyethylene bags. Isolate from other waste materials. Avoid runoff to natural waters.

### SECTION 7. HANDLING AND STORAGE

**Handling Procedures**
Keep container closed when not in use. Store in a cool, dry location away from incompatible materials. Avoid contact with skin and eyes. Do not inhale vapors. Do not reuse this container. Keep away from food and feed products.

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls**

**General Protection**
RESPIRATORY PROTECTION EQUIPMENT
Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists, vapours, or dusts is likely.

PROTECTIVE GLOVES:
Nitrile gloves.

EYE AND FACE PROTECTION:
Monogoggles.

OTHER PROTECTIVE EQUIPMENT:
Material Safety Data Sheet

BUCTRIL M

Long sleeves
VENTILATION:
Use only in well ventilated area.

Exposure Limits

ACGIH TLV
Bromoxynil octanoate
TWA: N/E
STEL: N/E
MCPA 2-Ethyl Hexyl Ester
TWA: N/E
STEL: N/E
Bromoxynil heptanoate
TWA: N/E
STEL: N/E

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical State</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>AROMATIC SOLVENT</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>(PPM): NA</td>
</tr>
<tr>
<td>pH</td>
<td>at NA</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>3 mmHg</td>
</tr>
<tr>
<td></td>
<td>at 37 °C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.15(WATER=1)</td>
</tr>
<tr>
<td>Density</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>at 25 °C</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>149 °C</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>FREEZING POINT: &lt;0 °C</td>
</tr>
<tr>
<td></td>
<td>MELTING POINT: NAp</td>
</tr>
<tr>
<td>Solubility (in water)</td>
<td>at 20 °C</td>
</tr>
<tr>
<td></td>
<td>emulsifiable</td>
</tr>
</tbody>
</table>
SECTION 10. STABILITY AND REACTIVITY

Chemical Stability
Stable

Conditions to Avoid
Keep away from heat, sparks and flame.

Incompatibility
Avoid contact with oxidizing agents, acids and bases.

Hazardous Products of Decomposition

Hazardous Polymerization (Conditions to avoid)
Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity
LD50(mg/kg): 368 (RAT) 368 (RAT)

Acute Dermal Toxicity
LD50(mg/kg): >2000(RBT)

Acute Inhalation Toxicity
LC50(mg/l): 2.46

Tested as moderately irritating to the skin (rbt) and severely irritating to the eye (rbt).

Assessment Carcinogenicity
The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, limited evidence for carcinogenicity in humans.

ACGIH
None

NTP
None

IARC
None

OSHA
None

Teratogenicity
EPA has classified bromoxynil as a class C oncogen. Based upon the results of rat and rabbit teratogenicity studies, bromoxynil phenol is considered to be a developmental toxicant. Women of childbearing age should be particularly careful when handling this product to avoid ingestion and skin contact. This product contains bromoxynil ester.
SECTION 12. ECOLOGICAL INFORMATION

Ecological Information
Aquatic toxicity: LC50(Rainbow trout): 0.05 mg/l (100%Bromoxynil octanoate).

Environmental Fate
No data at this time.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal
Disposal should be made in accordance with federal, provincial and local regulations.

RCRA Classification

SECTION 14. TRANSPORT INFORMATION

PESTICIDE, LIQUID, TOXIC, N.O.S. (Bromoxynil), Class 6.1, P.G. III
UN/NA NUMBER: UN# 2902

Marine Pollutant

SECTION 15. REGULATORY INFORMATION

This product is registered under the Pest Control Act.
PCP # 18022
WHMIS HAZARD CLASS: B3 COMBUSTIBLE LIQUID
SD1B TOXIC MATERIAL
SD2B TOXIC MATERIALS
WHMIS TRADE SECRET:
Exempt
CANADIAN INVENTORY:
This product is currently exempt from CEPA.
HAZARD RATING SYSTEMS
HMIS: FLAMMABILITY 3 , REACTIVITY 0 , HEALTH 2
NFPA: FLAMMABILITY 3 , REACTIVITY 0 , HEALTH 2

US Federal
EPA Registration No.
TSCA list
BROMOXYNIL OCTANOATE 1689-99-2
TSCA 12b export notification
None
SARA Title III - section 302 - notification and information
None
SARA Title III - section 313 - toxic chemical release reporting
None

US States Regulatory
CA Prop65
Material Safety Data Sheet

BUCTRIL M

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State right-to-know ingredients

None

Canadian Regulations

Canadian Registrat. No. 18022
Canadian Domestic Substance List None

Environmental

CERCLA None
Clean Water Section 307 Priority Pollutants None
Safe Drinking Water Act Maximum Contaminant Levels None

International Regulations

EU Classification
BROMOXYNIL OCTANOATE 1689-99-2 Harmful Dangerous for the environment

R Phrases Harmful in contact with skin and if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of harm to the unborn child.

S Phrases Keep out of the reach of children. Wear suitable protective clothing and gloves. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

European Inventory of Existing Commercial Substances (EINECS)
BROMOXYNIL OCTANOATE 1689-99-2
MCPA 2-Ethyl Hexyl Ester 29450-45-1
BROMOXYNIL HEPTANOATE 56634-95-8

SECTION 16. OTHER INFORMATION

Prepared by: The HSE Department of Bayer CropScience
Phone: (306) 721-0310

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