# MATERIAL SAFETY DATA SHEET

## SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

**Product identifier:** **DAWN™ HERBICIDE**
**Product use:** Emulsifiable concentrate formulation.
For weed control in cotton, dry beans, snap beans, and soybeans.

**Supplier's name and address:**

***Cheminova Inc.***
P.O. Box 110566
One Park Drive, Suite 150
Research Triangle Park, NC 27709
USA

**Manufacturer's name and address:**

Cheminova, Inc.
P.O. Box 110566
One Park Drive, Suite 150
Research Triangle Park, NC 27709
USA

Company Phone Number: (919) 474-6600 (8:00 AM to 5:00 PM EST, Monday to Friday)
**24 Hour Emergency Telephone Numbers:** 1-866-303-6950 (Medical Emergencies)
1-800-424-9300 (Chemtrec – Continental U.S.)
(703) 527-3887 (Chemtrec – Outside U.S.)

**MSDS Prepared by:** Cheminova, Inc.
**MSDS Preparation date:** May 14, 2009
**Revision date:**
**Revision reasons:**

## SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

| | | | ACGIH TLV | | OSHA PEL | |
|---|---|---|---|---|---|---|
| **Ingredients** | **CAS #** | **% (weight)** | **TWA** | **STEL** | **PEL** | **STEL** |
| *Sodium Salt of Fomesafen | 108731-70-0 | 22.1 – 23.5 | N/Av | N/Av | N/Av | N/Av |
| Ethanol | 64-17-5 | 3.0 – 7.0 | 1000 ppm | N/Av | 1000 ppm<br>1900 mg/m$^3$ | N/Av |

*Note: The product contains a nominal concentration of 22.8 % w/w of the active ingredient Fomesafen as its sodium salt, which is equivalent to 21.7 % w/w Fomesafen (CAS # 72178-02-0).

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

## SECTION 3 — HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

Clear, yellow to amber, liquid, faint odor.
Harmful if swallowed or inhaled. Avoid ingestion. Avoid inhalation of vapors or spray mist.
Causes substantial but temporary eye injury. Avoid contact with eyes, skin or clothing.

**Keep out of reach of children.**

May be hazardous to the environment. This product is toxic to terrestrial plants.
This product is persistent in soil and water, and may leach into groundwater.

***POTENTIAL HEALTH EFFECTS***

**Target organs:** Eyes, skin, respiratory system, central nervous system and the liver.

**Signs and symptoms of short-term (acute) exposure:**

*Inhalation:* May cause irritation to the respiratory tract. Symptoms may include sore throat, running nose, and shortness of breath.

*Skin contact:* May cause skin irritation. Symptoms may include redness, itching, and swelling.

*Eye contact:* Causes severe eye irritation. Symptoms may include burning, watering, and/or blurred vision.

*Ingestion:* Harmful if swallowed. Symptoms may include irritation of the mouth throat, and stomach; nausea, vomiting, dizziness, drowsiness, and other symptoms on central Nervous system depression. Aspiration into the lungs subsequent to swallowing or vomiting may cause chemical pneumonia, which can be fatal.

**Effects of long-term (chronic) exposure:** Prolonged or repeated overexposure may cause liver effects.

**Carcinogenicity:** Although the active ingredient in this product did produce liver tumors in laboratory animals, the EPA classified fomesafen as "not likely to be carcinogenic in humans". This classification is based on the weight-of-evidence giving consideration to its specific mode of action for hepatocarcinogenesis and the absence of mutagenesis and cytotoxicity. Fomesafen did not cause birth defects or infertility in laboratory animals.

**Potential physical hazards:** This product is a combustible liquid that can decompose at high temperatures forming irritating and toxic gases. May react with strong oxidizers, reducing agents, and alkaline metals.

**Potential environmental effects:** Slightly to practically non-toxic to birds, fish, aquatic invertebrates, and bees. Toxic to non-target terrestrial and aquatic plant species. Avoid spray drift and keep out of waterways.

## SECTION 4 — FIRST AID MEASURES

**Ingestion:** Call a physician or Poison Control Center immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Have product or container label with you when calling a poison control center or doctor or going for treatment.

**Eyes:** Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, and then continue rinsing. Call a poison control center for treatment advice.

**Inhalation:** Remove person to fresh air. If person is not breathing call an emergency number for medical treatment immediately and begin artificial respiration, preferably mouth to mouth. Call a poison control center or doctor for further treatment advice.

**Skin:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

**Note to physician**: This product has low oral, dermal, and inhalation toxicity. If swallowed, gastric lavage using an endotracheal tube may be preferred to vomiting. This product is a severe eye irritant, and may cause irritation to the skin and respiratory tract. Treatment is otherwise controlled by removal of exposure followed by symptomatic and supportive care.

## SECTION 5 — FIRE FIGHTING MEASURES

**Fire hazards/conditions of flammability:** Combustible liquid and vapor. Will ignite when exposed to heat, flame and other sources of ignition. Vapors can travel to a source of ignition and flash back causing an explosion and fire. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure. Thermal decomposition during a fire can produce fumes and irritating gases.

**Flammability classification (OSHA 29 CFR 1910.1200):** Class II Combustible Liquid.

**Flash point (Method):** 40°C/104°F (Pensky-Martens CC).

**Lower flammable limit (% by volume):** N/Av

**Upper flammable limit (% by volume):** N/Av

**Explosion data:**

*Sensitivity to mechanical impact:* Not sensitive.

*Sensitivity to static discharge:* Not expected to be sensitive to static discharge.

**Auto-ignition temperature:** N/Av

**Suitable extinguishing media:** Use dry foam, dry chemical, carbon dioxide, or water fog when fighting fires involving this material. Do not use water jet, as this may spread burning material. Minimize the use of water to avoid environmental contamination. Contain all runoff.

**Special fire-fighting procedures/equipment:** Fire fighters should wear proper chemically protective equipment and self-contained breathing apparatus with full face piece and operated in positive pressure mode. Evacuate the area and fight fire upwind from a safe distance to avoid hazardous vapors and decomposition products. Dike and collect fire-extinguishing water to prevent environmental damage and excessive waste runoff.

**Hazardous combustion products:** Carbon oxides, sulphur oxides, nitrogen oxides, sodium oxides, halogenated compounds, irritating fumes and smoke.

**NFPA Rating:** Health; 2 Flammability; 2 Reactivity; 0:

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Clean up spills immediately, observing precautions in Section 8, EXPOSURE CONTROLS/ PERSONAL PROTECTION. Isolate the hazard area. Keep unnecessary personnel from entering the area.

**Environmental precautions:** Ensure spilled product does not enter drains, sewers, waterways, or confined spaces.

**Spill response/Cleanup:** It is recommended to have a predetermined plan for the handling of spills. Empty recovery drums for the collection of spills should be available. Eliminate all sources of heat, sparks and flame. Ventilate area of

release. Stop leak if you can do so without risk. For spills on the floor or other impervious surfaces, absorb spill with inert, non-combustible absorbent material, such as hydrated lime, Fuller's earth or other absorbent clays. Scoop up and place contaminated absorbent material into appropriate recovery drums for later disposal (Refer to Section 13). After removal, neutralize the spill area, tools, and equipment with a dilute alkaline solution (soda ash or lime) followed by an appropriate alcohol (methanol, ethanol, or isopropanol). Wash the spill area, tools, and equipment with strong soap and water solution, then rinse thoroughly. Absorb any excess liquid and add to the recovery drums of waste already collected. Do not flush to sewer or allow to enter confined spaces. Large spills that soak into the ground should be dug up, placed in suitable containers and disposed of appropriately (Refer to Section 13). Notify the appropriate authorities. Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body. The used containers should be properly closed and labelled. Refer to section 13 for disposal.

**Prohibited materials:** Do not use metal containers.

**Special spill response procedures:** If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center (phone: 1-800-424-8002).

**EPA/CERCLA Reportable quantity:** None known.

## SECTION 7 — HANDLING AND STORAGE

**KEEP OUT OF REACH OF CHILDREN**

**Safe handling procedures:** This material is a combustible, harmful liquid. Wear chemical resistant protective equipment when handling. Use only in a well ventilated area. Avoid contract with skin, eyes and clothing. Do not breathe fumes, mist, vapors, or spray. Keep away from heat and flame. Avoid contact with incompatible materials. (Refer to Section 10) Use caution when opening cap. Keep containers tightly closed when not in use. Wash thoroughly after handling this material.

**Storage recommendations:** Keep in original containers, tightly closed, out of reach of children. Keep away from food, drink and animal feeding stuffs. Containers should be stored in a cool, dry, well-ventilated area away from flammable materials and sources of heat or flame.

**Special packaging materials:** Always keep in containers made of the same materials as the supply container.

## SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Exposure limits:** (8-Hour TWA): 1000 ppm; 1900 mg/m$^3$ (Refer to Section 2)

**Ventilation and engineering controls:** Proper ventilation is required when handling or using this product to maintain exposure below the 8-hour TWA. Ventilate all transport vehicles prior to unloading. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**Respiratory protection:** When handling in enclosed areas, when large quantities of mists are generated, or prolonged exposure is possible in excess of the 8-hour TWA, use a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSG approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

**Protective gloves:** Wear impervious chemical gloves, such as barrier laminate, butyl rubber, nitrile rubber or Viton®.

**Eye protection:** Wear safety glasses with side shields or chemical splash goggles to prevent vapors or mists from entering the eyes. If using a full face shield, always use safety glasses or goggles along with the face shield to ensure adequate protection of the eyes.

**Other protective equipment:** Wear chemical resistant overalls or long-sleeved uniform, head covering, and chemical resistant footwear plus socks. Discard clothing or other absorbent materials that have been heavily contaminated with this product. Do not re-use them. Follow manufacturer's instructions for cleaning and maintaining personal protective equipment (PPE). If no such instructions exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

**General hygiene considerations:** Avoid breathing vapors or mists. Avoid contact with eyes, skin and clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing, then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, take a shower using soap and water, and change into clean clothing.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical state, odor and appearance:** | Clear yellow to amber liquid. Faint odor. |
| **Odor threshold:** | N/Av |
| **Specific gravity (water = 1):** | 1.103 gm/$cm^3$ –or- 9.20 lbs./gal. @ 25°C |
| **Solubility in water:** | Emulsifies with water. |
| **pH:** | 5.49 (1% aqueous solution). |
| **Boiling point:** | N/Av |
| **Melting/Freezing point:** | N/Av |
| **Vapour density (Air=1.0):** | N/Av |
| **Percent Volatile by Weight:** | N/Av |
| **Evaporation rate (n-BuAc=1.0):** | N/Av |
| **Vapour pressure:** | N/Av |
| **Coefficient of n-Octanol/water distribution:** | N/Av |
| **Viscosity:** | N/Av |
| **Flash Point:** | 40°C/104°F |
| **Empirical formula:** | $C_{15}H_9ClF_3N_2NaO_6S$ |
| **Molecular weight:** | 460.7 |

## SECTION 10 — REACTIVITY AND STABILITY DATA

**Stability and reactivity:** This product is stable under the recommended storage and handling conditions described in Section 7.

**Hazardous polymerization:** Product will not undergo polymerization.

**Conditions to avoid:** Keep this product away from heat, sparks, flame, and other sources of ignition (e.g. pilot lights, electric motors, static electricity).

**Materials to avoid (incompatibles):** Strong oxidizing agents, acids, hydrogen peroxide, ammonia, alkali metals, bases, and reducing agents..

**Hazardous decomposition products:** Carbon oxides, sulfur oxides, nitrogen oxides, sodium oxides, ammonia, and halogenated compounds.

## SECTION 11 — TOXICOLOGICAL INFORMATION

**Routes of exposure:** Skin contact, eye contact, inhalation, and ingestion.

**Acute toxicological data:**

$LD_{50}$, oral, rat (mg/kg) = 3129
$LD_{50}$, dermal, rat (mg/kg) = >5000
$LC_{50}$ (4 hr.), inhalation, rat (mg/L) = 2.09
Eye irritation, rabbit = Severe eye irritation, clears in 14 days
Skin irritation, rabbit = Moderate skin irritation
Skin sensitization, guinea pig = Non-sensitizer

**Carcinogenicity:** This product does not contain any materials which are classified as carcinogenic by IARC, ACGIH, OSHA or NTP.

**Teratogenicity, mutagenicity, other reproductive effects:** None known.

## SECTION 12 — ECOLOGICAL INFORMATION

**Chemical fate information:** Fomesafen is persistent in soil and aquatic environments (half-life in soils from 63 to 527 days and in water from 49 to 289 days), however, it degrades rapidly under anaerobic conditions (half-life is less than 20 days). Fomesafen and its degradates are mobile in soils and have a potential to move into groundwater and to be transported off-site via runoff into surface waters. Studies indicate that fomesafen has a very low potential for bioaccumulation.

**Ecotoxicological information:** Slightly to practically non-toxic to birds, fish, aquatic invertebrates, and bees. Toxic to non-target terrestrial plant species, primarily dicots; non-toxic to aquatic plants. Avoid spray drift and keep out of waterways.

## SECTION 13 — DISPOSAL CONSIDERATIONS

**Handling for disposal:** Handle waste according to recommendations in Section 7. Pesticide wastes are toxic. Dispose of in accordance with Federal, state, and local laws and regulations.

**Methods of disposal:** Refer to product label. Empty containers retain product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed. Triple rinse (or equivalent) emptied containers, then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill. Do not contaminate water when disposing of rinse waters. Contact your local, state or federal environmental agency for specific rules.

## SECTION 14 — TRANSPORTATION INFORMATION

**Proper shipping name:** Combustible liquid, n.o.s.
**Hazard class or division:** Combustible liquid
**Identification number:** NA 1993
**Packing group:** III
**Additional information:** This classification does not apply to transportation by vessel or by aircraft. Refer to the IMDG and IATA regulations for an appropriate classification.

## SECTION 15 — REGULATORY INFORMATION

**Regulations under FIFRA:** All pesticides are governed under FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act). Therefore, the regulations presented are pertinent only when handled outside of the normal use and applications of pesticides. This includes waste streams resulting from manufacturing/formulating facilities, spills or misuse of products, and storage of large quantities of products containing hazardous or extremely hazardous substances.

**EPA/CERCLA Reportable Quantity (RQ):** None known.

**SARA TITLE III:**

*Sec. 302, Extremely Hazardous Substance Notification:* This material is not known to contain any Extremely Hazardous Substances.

*Sec. 311/312, Hazard Categories:* Fire hazard
Immediate health hazard
Chronic health hazard.

*Sec. 313, Toxic Chemicals Notification*: This material is not known to contain any Toxic Chemical constituents.

**CLEAR AIR ACT:** Not listed

**CLEAN WATER ACT:** Not listed

**California Proposition 65 information:** This product does not contain any chemicals known to the state of California to cause cancer or reproductive harm.

## SECTION 16 — OTHER INFORMATION

**HMIS Rating:** Health; 2 Flammability; 2 Reactivity; 0

**Legend:**
ACGIH – American Conference of Governmental Industrial Hygienists
CAS - Chemical Abstract Service
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR – Code of Federal Regulations
EPA – Environmental Protection Agency
HMIS – Hazardous Materials Identification System
IARC – International Agency for Research on Cancer
Inh – Inhalation
MSHA – Mine Safety and Health Administration
N/Ap – Not Applicable
N/Av – Not Available
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEHHA – Office of Environmental Health Hazard Assessment
OSHA – Occupational Safety and Health Act
PEL - Permissible Exposure Limit
PMCC – Pensky Martins Closed Cup

RCRA – Resource Conservation and Recovery Act
SARA - Superfund Amendments & Reauthorization Act
TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
TWA - Time Weighted Average
WHMIS – Workplace Hazardous Materials Information System

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

**NOTICE:** The information herein is presented in good faith and believed to be accurate as on the effective date shown below. However, no warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with Federal, State and Local laws and regulations.

**Prepared by:** Cheminova Inc.
**Telephone #:** (919) 474-6600 (8 AM to 5:00 PM EST, Monday to Friday)
**Original date:** May 14, 2009
**Revision date:**
**Revision reasons:**