

PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**PAGE 1 OF 10
EFFECTIVE DATE: February 14, 2018**SECTION 1– IDENTIFICATION OF SUBSTANCE AND OF SUPPLIER**PRODUCT NAME: **CALSOL 100**

SYNONYMS: PROPRIETARY DENATURED ALCOHOL FORMULATION CALSOL 100

CHEMICAL FAMILY: Alcohols, alkaloids

RECOMMENDED USE: Transfer fluid for ground source heat systems.

RESTRICTIONS ON USE: Refer to the alcohol control authority in country in which the product is to be used– Canada Revenue Agency (Excise) in Canada, US Tax and Trade Bureau in US etc.

SUPPLIER: **Commercial Alcohols, a Trade name of GreenField Global Inc.**
6985 Financial Drive, Mississauga, Ontario, Canada L5N 0G3
Web page: <http://www.greenfield.com/>

NON-EMERGENCY INFORMATION PHONE NUMBER: (905) 790-7500

EMERGENCY PHONE NUMBER: CANUTEC (613) 996-6666**SECTION 2– HAZARDS IDENTIFICATION**

GHS label elements, including precautionary statements:

Signal Word:
DANGER!**Hazard statement(s)**H225 Highly flammable liquid and vapor.
H315 + H320 Causes skin and eye irritation
H335 May cause respiratory irritation.**Precautionary statement(s)**P501 Dispose of contents and container to an approved waste disposal plant.
P240 Ground/bond container and receiving equipment.
P337 + P313 If eye irritation persists: Get medical attention.

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN.



PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 2 OF 10
EFFECTIVE DATE: February 14, 2018

(SECTION 2 HAZARDS IDENTIFICATION CONTINUED)

- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention.
- P303 + P361 + P353 IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water.
- P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
- P210 Keep away from heat, sparks, open flames, and hot surfaces. No smoking.
- P233 Keep container tightly closed.
- P403 + P235 Store in a well-ventilated place. Keep cool.
- P243 Take precautionary measures against static discharge.
- P241 Use explosion-proof electrical, ventilating, and lighting equipment.
- P242 Use only non-sparking tools.
- P264 Wash hands thoroughly after handling.
- P280 Wear protective gloves and eye and face protection.

GHS Classification(s)

- Flammable Liquids (Category 2)
- Eye irritation (Category 2B)
- Skin irritation (Category 2)
- Specific target organ toxicity - single exposure (Category 3)

Other hazards which do not result in classification:

Potential health Effects:

Organ	Description
Eyes	Can cause eye irritation. Common symptoms include stinging, tearing, and redness.
Ingestion	Can cause gastrointestinal irritation with nausea, vomiting and diarrhea. Systemic toxicity and acidosis can occur. Advanced stages can lead to respiratory failure,, kidney failure, coma and death.
Inhalation	Causes respiratory tract irritation. Can cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation. Systemic toxicity and acidosis can occur. Advanced stages can lead to respiratory failure,, kidney failure, coma and death.
Skin	Causes moderate skin irritation. Can cause dermatitis by de-fatting the skin from prolonged or repeated contact

PRODUCT NAME: **CALSOL 100**
 MSDS NO: **1890**

 PAGE 3 OF 10
 EFFECTIVE DATE: February 14, 2018

SECTION 3– COMPOSITION AND INFORMATION ON INGREDIENTS

CHEMICAL NAME: CALSOL 100
COMMON NAME/ SYNONYM: PROPRIETARY DENATURED ALCOHOL FORMULATION CALSOL 100

INGREDIENT	% VOLUME	CAS NO.	EINECS NO.
Ethyl Alcohol	93.7-94.7	64-17-5	200-578-6
Denatonium benzoate	0.7 g/100L	3734-33-6	223-095-2
Pine Oil	0.25	8002-09-3	204-455-9
FD&C blue dye or methylene blue	0.5 g/100L	3844-45-9	223-339-8
Alkyl Dimethylbenzyl Ammonium Chloride	0.0054	8001-54-5	264-151-6
Water	balance	7732-18-5	231-791-2

SECTION 4– FIRST AID MEASURES

<u>INHALATION</u>	<ul style="list-style-type: none"> Remove victim to fresh air. Artificial respiration should be given if breathing has stopped and cardiopulmonary resuscitation if heart has stopped. Oxygen may be given if necessary. Seek medical attention immediately.
<u>SKIN</u>	<ul style="list-style-type: none"> Flush contaminated area with water for at least 20 minutes. Remove contaminated clothing under running water. Completely decontaminate clothing before re-use, or discard. If irritation occurs seek medical attention.
<u>EYES</u>	<ul style="list-style-type: none"> Immediately flush eyes with water for at least 20 minutes, holding the eyelids open. Seek medical attention immediately.
<u>INGESTION</u>	<ul style="list-style-type: none"> Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. DO NOT INDUCE VOMITING. Have victim drink about 250ml (8fl. oz.) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Seek medical assistance.
<u>NOTES TO PHYSICIAN</u>	<ul style="list-style-type: none"> Symptoms of ethanol intoxication vary with the alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.05-0.15% and approximately 25% of individuals will show signs of intoxication at these levels. Above 0.15% the person is definitely under the influence of ethanol and 50-95% of individuals at this level are clinically intoxicated. Severe poisoning occurs when the blood ethanol level is 0.3-0.5%. Above 0.5% the individual will be comatose and death can occur. The unabsorbed ethanol should be removed by gastric lavage after intubating the patient to prevent aspiration. Avoid the use of depressant drugs or the excessive administration of fluids. This product contains an additional ingredient in low amount and relatively low toxicity: denatonium benzoate. This product also contains the following ingredients in low amounts: pine oil, FD&C blue dye or methylene blue dye, and alkyl dimethyl benzyl ammonium chloride.

SECTION 5– FIRE FIGHTING MEASURES

<u>EXTINGUISHING MEDIA</u>	<ul style="list-style-type: none"> Apply alcohol-type or all-purpose-type foams by manufacturers' recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires. Water is generally unsuitable for large open pools of alcohol and may help to spread the fire.
<u>UNUSUAL FIRE AND EXPLOSION HAZARDS</u>	<ul style="list-style-type: none"> Vapours form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from handling point.
<u>SPECIAL FIREFIGHTING PROCEDURES</u>	<ul style="list-style-type: none"> Use water spray to cool fire-exposed containers and structures. Use water spray to disperse vapours; reignition is possible. Use self-contained breathing apparatus and protective clothing.



PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 4 OF 10
EFFECTIVE DATE: February 14, 2018

SECTION 6– ACCIDENTAL RELEASE MEASURES

SPILL

- Contain spilled material.
- Provide adequate ventilation. Provide adequate personnel protective equipment for responders.
- Remove sources of heat, sparks or flames.
- Spill should be collected in suitable containers or absorbed on a suitable absorbent material for subsequent disposal. Such containers used to contain spilled material and absorbent should be sealed off, otherwise the collected alcohol will evaporate from them.

WASTE DISPOSAL

- Waste material should be disposed of in an approved incinerator or in a designated landfill site, in compliance with all federal, provincial and local government regulations.

SECTION 7– HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

- Keep away from heat, sparks and flames.
- Keep container closed when not in use.
- Use with adequate ventilation.
- Avoid breathing vapours.
- Avoid contact with eyes and skin.
- Wash exposed skin thoroughly after handling.
- Take precautions to prevent static electricity build-up when transferring contents.

OTHER PRECAUTIONS

- Good personal hygiene practices are suggested, such as abstaining from eating, drinking and smoking in the workplace.

SECTION 8– EXPOSURE CONTROLS/ PERSONNEL PROTECTION

RESPIRATORY EQUIPMENT

- Up to 1000 ppm, an approved organic vapour cartridge respirator can be used.
- For concentrations above 1000 ppm, an air-supplying respirator is recommended.
- The user should consult a respirator guide, such as the Canadian Standards Association's guide Z94.4-M1982.

VENTILATION

- The ventilation system should be non-sparking, grounded and separate from other exhaust ventilation systems.
- Local ventilation is recommended when handling.

PROTECTIVE GLOVES

- Neoprene, butyl or natural rubber.

EYE PROTECTION

- Chemical resistant monogoggles when handling

OTHER PROTECTIVE EQUIPMENT

- Eye bath, safety shower and other protective equipment as required.

PRODUCT NAME: **CALSOL 100**
 MSDS NO: **1890**

 PAGE 5 OF 10
 EFFECTIVE DATE: February 14, 2018

SECTION 9– PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Blue to purple coloured liquid	
ODOUR	Typical ethanol/ lower alcohol odour	
ODOUR THRESHOLD	Approximately 0.1 to 5100 ppm for ethyl alcohol, as reported in appendix 1 of the Canadian Standards Association guide Z94.4-M1982.	
PH	Not Applicable	
MELTING./ FREEZING POINT	Approximately minus 100 deg. C	
BOILING POINT RANGE	78.3-100 deg. C (boiling point 78.3 deg. C for 100% Ethanol)	
FLASH POINT	16 (Tag closed cup, ASTM D-56)	
EVAPORATION RATE	1.7 (butyl acetate = 1)	
LOWER FLAMMABILITY LIMIT	3.3% V/V for 100% Ethanol	
UPPER FLAMMABILITY LIMIT	19 % V/V for 100% Ethanol	
VAPOR PRESSURE	44 mm Hg @ 20 deg. C, for 100% Ethanol	
VAPOUR DENSITY	1.56 (air=1)	
RELATIVE DENSITY (LIQUID)	0.810 to 0.816 @ 20°C	
SOLUBILITY IN WATER	Complete	
SOLUBILITY IN OIL- COEFFICIENT OF WATER/OIL DISTRIBUTION	Separates from oil	
PARTITION COEFFICIENT N– OCTANOL/ WATER	0.032 approx.	
AUTO- IGNITION TEMPERATURE	Approx. 370 deg. C	
DECOMPOSITION TEMPERATURE	Specific data not available	
VISCOSITY	Approx. 1.35 cp @ 20 deg. C	
% VOLATILES BY VOLUME	100	
CHEMICAL FORMULA	Ethanol: C ₂ H ₅ -OH Denatonium benzoate: C ₂₈ H ₃₄ N ₂ O ₃ Pine Oil: NA FD&C Blue Dye: C ₃₇ H ₃₆ N ₂ O ₉ S ₃ Na ₂ Alkyl dimethylbenzyl ammonium chloride: C ₁₇ H ₃₀ ClN Water: H ₂ O	Molecular weight: 46.07 Molecular weight: 446.57 Molecular weight: NA Molecular weight: 794 360 Molecular weight: 18.02

SECTION 10– STABILITY AND REACTIVITY

CHEMICAL STABILITY/ REACTIVITY	Stable
CONDITIONS TO AVOID	Sources of ignition
POSSIBILITY OF HAZARDOUS REACTIONS/ INCOMPATIBILITIES	Oxidizing materials
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS	Burning can produce carbon monoxide and/or carbon dioxide and/or formaldehyde.
HAZARDOUS POLYMERIZATION	Will not occur
CONDITIONS TO AVOID	None currently known



PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 6 OF 10
EFFECTIVE DATE: February 14, 2018

SECTION 11– TOXICOLOGICAL INFORMATION

INGREDIENT	% V/V	TLV, ppm	LC50, ppm/4h.	LD50, mg/kg	LD50, mg/kg
			RAT, INHAL.	RAT, ORAL	RABBIT, SKIN
Ethyl Alcohol	93.7-94.7	1000	31,623	7,060	20,000
Denatonium benzoate	0.7 g/100L	NA	NA	584 mg/kg	NA
Pine Oil	0.25	NA	NA	2760	3000
FD&C blue dye or methylene blue	0.5 g/100L	NA	NA	NA	NA
Alkyl Dimethylbenzyl Ammonium Chloride	0.0054	NA	NA	240	930-1420 (rat)
Water	balance	NA	NA	NA	NA

REFERENCES: ACGIH (1988-1989), RTECS (1983).

INGESTION

- May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, euphoria, abdominal discomfort, nausea, vomiting, staggering gait, lack of coordination and coma.

SKIN ABSORPTION

- No adverse effects with normal skin. However, potentially harmful amounts of material may be absorbed across markedly abraded skin when contact is sustained, particularly in children.

INHALATION

- High vapour concentrations may cause a burning sensation in the throat and nose, stinging and watering in the eyes.
- At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea and vomiting may occur.

SKIN CONTACT

- Mild irritant.
- Repeated or prolonged exposure may lead to dermatitis, erythema and scaling.

EYE CONTACT

- Severe eye irritant.
- Vapours can irritate eyes.
- Eye damage from contact with liquid is reversible and proper treatment will result in healing within a few days.
- Damage is usually mild to moderate conjunctivitis, seen mainly as redness of the conjunctiva.

EFFECTS OF LONG-TERM EXPOSURE

- Long term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE

- Repeated exposure to ethanol may exacerbate liver injury produced from other causes.

OTHER– REPRODUCTIVE TOXICITY OF ETHANOL WHEN CONSUMED AS A BEVERAGE DURING PREGNANCY

- Ethanol has been identified in studies as a developmental toxicant when consumed as a beverage during pregnancy.



PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 7 OF 10
EFFECTIVE DATE: February 14, 2018

SECTION 12– ECOLOGICAL INFORMATION

Ethyl Alcohol CAS 64-17-5

Ecotoxicity (aquatic and terrestrial, where available):

Acute Fish toxicity (ETHANOL)

LC50 / 96 HOUR *Oncorhynchus mykiss* (rainbow trout) > 10,000 mg/l

LC50 / 96 HOUR *Pimephales promelas* (fathead minnow) > 13,400 mg/l

Toxicity to aquatic plants (ETHANOL)

Growth inhibition / 96 HOURS *Chlorella vulgaris* (Fresh water algae) 1,000 mg/l

Toxicity to microorganisms (ETHANOL)

Toxicity Threshold / *Pseudomonas putida* 6,500 mg/l

Summary: Inhibition of cell multiplication begins.

Persistence and degradability:

Biodegradation is expected.

Bioaccumulative potential:

Biaccumulation is unlikely

Other adverse effects:

BOD: 740-840 mg/g

Denatonium benzoate CAS 3734-33-6

Ecotoxicity (aquatic and terrestrial, where available):

Acute Fish Toxicity (DENATONIUM BENZOATE)

LC50/ 96 h Rainbow trout > 1000 mg/L

Persistence and degradability:

No data available

Bioaccumulative potential:

Biaccumulation is unlikely

Other adverse effects:

No data available





PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 8 OF 10
EFFECTIVE DATE: February 14, 2018

SECTION 12– ECOLOGICAL INFORMATION (CONTINUED)

Pine Oil CAS 8002-09-3

Ecotoxicity: TOXIC TO FISH AND AQUATIC ORGANISMS.

Mobility: Not determined.

Persistence and Degradability: Not determined.

Bioaccumulation Potential: Not determined.

Ozone Depleting Substances: None.

FD&C Blue Dye CAS 3844-45-9

Toxicity to terrestrial and aquatic plants and animals: Information given is based on data on the components and the ecotoxicology of similar products

Ecotoxicity effects:

Aquatic toxicity:

Freshwater Fish Species Data:

LC50 - Oncorhynchus mykiss (rainbow trout) - 412/mg/l - 96 h

Water Flea Data: EC50 - Daphnia magna (water flea) - >97 mg/l - 48 h

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Alkyl Dimethylbenzyl Ammonium Chloride CAS 8001-54-5

Aquatic

Fish LC50 Bluegill (Lepomis macrochirus) 0.223 - 0.46 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential Not available.

Mobility in soil Not available.

Other adverse effects Not available.



PRODUCT NAME: **CALSOL 100**
MSDS NO: **1890**

PAGE 9 OF 10
EFFECTIVE DATE: February 14, 2018

SECTION 13– DISPOSAL CONSIDERATIONS

SPILL

- Contain spilled material.
- Provide adequate ventilation and protective equipment.
- Remove sources of heat, sparks or flames.
- Spill should be collected in suitable containers or absorbed on a suitable absorbent material for subsequent disposal.

WASTE
DISPOSAL

- Waste material should be disposed of in an approved incinerator or in a designated landfill site, in compliance with all federal, provincial and local government regulations.

SECTION 14– TRANSPORT INFORMATION

CANADA: UN number: 1987

UN proper shipping name Alcohols N.O.S. (ETHANOL)

Transport hazard class(es) Primary Class 3 Subsidiary Class NONE

Packing group (if applicable) II

IMDG

UN-Number: UN1987 Class: 3 Packing Group: II

EMS-No: F-E, S-D

Proper shipping name: ALCOHOLS, N.O.S. (ETHANOL)

Marine pollutant: No

IATA

UN-Number: 1987 Class: 3 Packing Group: II

Proper shipping name: ALCOHOLS, N.O.S. (ETHANOL)

SECTION 15– REGULATORY INFORMATION

All ingredients are on the following inventories or are exempted from listing:

Country Notification

Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Korea	ECL
New Zealand	NZIoC
Philippines	PICCS
USA	TSCA

California Prop 65 Components

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm when drunk as a beverage: (ETHYL ALCOHOL) CAS No. 64-17-5 Revision Date: December 11, 2009



PRODUCT NAME: **CALSOL 100**

PAGE 10 OF 10

MSDS NO: **1890**

EFFECTIVE DATE: February 14, 2018

SECTION 16– OTHER INFORMATION

PREPARED BY: Alcohol QA, Technical Services, and Regulatory Affairs Department

PHONE NUMBER: (905) 790-7500



GREENFIELD GLOBAL URGES EACH CUSTOMER OR RECIPIENT OF THIS MSDS TO STUDY IT CAREFULLY TO BECOME AWARE OF AND UNDERSTAND THE HAZARDS ASSOCIATED WITH THE PRODUCT. THE READER SHOULD CONSIDER CONSULTING REFERENCE WORKS OR INDIVIDUALS WHO ARE EXPERTS IN VENTILATION, TOXICOLOGY OR FIRE PREVENTION, AS NECESSARY OR APPROPRIATE TO USE AND UNDERSTAND THE DATA CONTAINED IN THIS MSDS.

TO PROMOTE SAFE USE AND HANDLING OF THIS PRODUCT, EACH CUSTOMER OR RECIPIENT SHOULD

- (1) NOTIFY EMPLOYEES, AGENTS, CONTRACTORS AND OTHERS WHO MAY USE THIS MATERIAL, OF THE INFORMATION IN THIS MSDS AND ANY OTHER INFORMATION REGARDING HAZARDS OR SAFETY,
- (2) FURNISH THIS SAME INFORMATION TO EACH CUSTOMER FOR THE PRODUCT, AND
- (3) REQUEST CUSTOMERS TO NOTIFY THEIR EMPLOYEES, CUSTOMERS, AND OTHER USERS OF THE PRODUCT OF THIS INFORMATION.