1. Identification

Product identifier: Ethyl alcohol, anhydrous

Other means of identification:
- CAS number: 64-17-5
- Synonyms: Ethanol, Absolute ethanol, Alcohol (anhydrous), Ethyl alcohol 200 proof

Recommended use: General purpose solvent.

Recommended restrictions: Refer to the alcohol control authority in which the product is to be used - Canada Revenue Agency (Excise) in Canada, US Tax and Trade Bureau in the US, etc.

Manufacturer/Importer/Supplier/Distributor information:
- Company name: Greenfield Global Inc.
- Address: 6985 Financial Drive, Missisauga, Ontario L5N 0G3, Canada
- Telephone: (905) 790-7500
- Website: http://www.greenfield.com
- Emergency phone number: CANUTEC: (613) 996-6666

2. Hazard identification

Physical hazards: Flammable liquids Category 2

Health hazards: Serious eye damage/eye irritation Category 2

Label elements:
- Signal word: Danger

Precautionary statement:
- Response: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. In case of fire: Use appropriate media to extinguish.

Storage: Store in a well-ventilated place. Keep cool.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards: None known.

Supplemental information: None.

3. Composition/information on ingredients

Substances:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol</td>
<td></td>
<td>64-17-5</td>
<td>100</td>
</tr>
</tbody>
</table>

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
4. First-aid measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed
Headache. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Coughing.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information
Take off all contaminated clothing immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
Vapours may form explosive mixtures with air. Vapours may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
Highly flammable liquid and vapour.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil etc) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Clean surface thoroughly to remove residual contamination.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid contact with eyes. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>TWA</td>
<td>1880 mg/m3</td>
</tr>
<tr>
<td>Canada. Alberta OELs (Occupational Health &amp; Safety Code, Schedule 1, Table 2)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>STEL</td>
<td>1000 ppm</td>
</tr>
<tr>
<td>Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>TWA</td>
<td>1880 mg/m3</td>
</tr>
<tr>
<td>Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td>15 minute</td>
<td>1250 ppm</td>
</tr>
<tr>
<td>8 hour</td>
<td>1000 ppm</td>
<td></td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Butyl rubber or Viton® gloves are recommended. Other suitable gloves can be recommended by the glove supplier. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

Other

Wear appropriate chemical resistant clothing.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with organic vapour cartridge and full facepiece.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.
When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
- Physical state: Liquid.
- Form: Liquid.
- Colour: Clear liquid; invisible vapour.

Odour
- Odour: Sweet. Alcohol-like.

Odour threshold
- Odour threshold: Not available.

pH
- pH: Not available.

Melting point/freezing point
- Melting point/freezing point: Not available.

Initial boiling point and boiling range
- Initial boiling point and boiling range: 78.33 °C (173 °F)

Flash point
- Flash point: 12.8 °C (55.0 °F) Closed cup

Evaporation rate
- Evaporation rate: May evaporate quickly.

Flammability (solid, gas)
- Flammability limit - lower (%): 3.3 %
- Flammability limit - upper (%): 19 %

Vapour pressure
- Vapour pressure: 59.5 hPa (20 °C (68 °F))

Vapour density
- Vapour density: 1.6

Relative density
- Relative density: 0.785 g/ml (25 °C (77 °F))

Solubility(ies)
- Solubility (water): Completely soluble.

Partition coefficient (n-octanol/water)
- Partition coefficient (n-octanol/water): Not available

Auto-ignition temperature
- Auto-ignition temperature: 363 °C (685.4 °F)

Decomposition temperature
- Decomposition temperature: Not pertinent

Viscosity
- Viscosity: Not available.

Other information
- Explosive properties: Not explosive.
- Molecular formula: C2-H6-O
- Molecular weight: 46.07 g/mol
- Oxidising properties: Not oxidising.

10. Stability and reactivity

Reactivity
- The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
- Material is stable under normal conditions.

Possibility of hazardous reactions
- Hazardous polymerisation does not occur.

Conditions to avoid
- Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials.

Incompatible materials
- Strong oxidising agents.

Hazardous decomposition products
- No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure
- Inhalation: Prolonged inhalation may be harmful.
- Skin contact: Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
- Eye contact: Causes serious eye irritation.
Ingestion
Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics
Headache. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Coughing.

Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vapour</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>117 - 125 mg/l, 4 Hours</td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>10470 mg/kg</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skin corrosion/irritation
Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation
Causes serious eye irritation.

Respiratory or skin sensitisation
- **Respiratory sensitisation**: Not a respiratory sensitiser.
- **Skin sensitisation**: This product is not expected to cause skin sensitisation.
- **Germ cell mutagenicity**: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
- **Canada - Manitoba OELs: carcinogenicity**: Ethyl alcohol (CAS 64-17-5)  Confirmed animal carcinogen with unknown relevance to humans.

Reproductive toxicity
Possible reproductive hazard.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Not classified.

Aspiration hazard
Not an aspiration hazard.

Chronic effects
Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol (CAS 64-17-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>EC10</td>
<td>Freshwater algae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.5 mg/l, 72 hours</td>
</tr>
<tr>
<td></td>
<td>EC50</td>
<td>Freshwater algae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>275 mg/l, 72 hours</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>Marine water algae</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1900 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Freshwater fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11200 mg/l, 24 hours</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>Freshwater fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 mg/l</td>
</tr>
<tr>
<td>Invertebrate</td>
<td>EC50</td>
<td>Freshwater invertebrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5012 mg/l, 48 hours</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>Marine water invertebrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>857 mg/l, 48 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>EC50</td>
<td>Lemna minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4432 mg/l, 7 days</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>Lemna minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>280 mg/l, 7 days</td>
</tr>
</tbody>
</table>
### Product Test Results

<table>
<thead>
<tr>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-organisms</td>
<td>LC50 5800 mg/l, 4 hours</td>
</tr>
<tr>
<td>Terrestrial plant</td>
<td>EC50 633 mg/kg dw</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
- Expected to be readily biodegradable.

**Bioaccumulative potential**
- Potential to bioaccumulate is low.

**Mobility in soil**
- Expected to be highly mobile in soil.

**Other adverse effects**
- No data available.

### 13. Disposal considerations

**Disposal instructions**
- Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations**
- Dispose in accordance with all applicable regulations.

**Hazardous waste code**
- The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products**
- Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging**
- Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

### 14. Transport information

**TDG**
- **UN number**: UN1170
- **UN proper shipping name**: ETHANOL
- **Class**: 3
- **Subsidiary risk**: -
- **Packing group**: II
- **Environmental hazards**: No.
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.

**IATA**
- **UN number**: UN1170
- **UN proper shipping name**: Ethanol
- **Class**: 3
- **Subsidiary risk**: -
- **Label(s)**: 3
- **Packing group**: II
- **Environmental hazards**: No.
- **ERG Code**: 3L
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.

**IMDG**
- **UN number**: UN1170
- **UN proper shipping name**: ETHANOL
- **Class**: 3
- **Subsidiary risk**: -
- **Label(s)**: 3
- **Packing group**: II
- **Environmental hazards**: No.
- **EmS**: F-E, S-D
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.

This product is a liquid and when transported in bulk is covered under MARPOL 73/78 Annex II. This product is listed in the IBC Code. Pollution category: Z
15. Regulatory information

Canadian regulations
This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Controlled Drugs and Substances Act
Not regulated.

Export Control List (CEPA 1999, Schedule 3)
Not listed.

Greenhouse Gases
Not listed.

Precursor Control Regulations
Not regulated.

International regulations

Stockholm Convention
Not applicable.

Rotterdam Convention
Not applicable.

Kyoto Protocol
Not applicable.

Montreal Protocol
Not applicable.

Basel Convention
Not applicable.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Industrial Chemicals (AICIS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taiwan Chemical Substance Inventory (TCSI)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date          01-February-2021
Revision date       -
Version No.          01

Disclaimer
This product is subject to Greenfield Global Inc.'s terms and conditions, which can be found at http://www.greenfield.com/tc-po-can/. Greenfield cannot anticipate all conditions under which this information and this product, or the products of other manufacturers in combination with this product, may be used. The user is responsible for the proper and safe use, handling, storage and disposal of the product, and assumes liability for any loss, injury, damage or expense arising from any failure to do so. The data in this sheet is based on information and experience available at the time of writing.