SAFETY DATA SHEET

Special Industrial Solvent (SIS) Formula D-2, 200 Proof
This SDS is valid for all grades and catalog #s

1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF SUPPLIER

Product Identifier: Ethanol
Synonyms: Denatured Alcohol; Denatured Ethanol
Other means of identification: CAS No. 64-17-5
EINECS No. 200-578-6

Recommended use of the chemical and restrictions on use:

Supplier Details:

Greenfield Global USA, Inc.
1101 Isaac Shelby Drive, Shelbyville,
KY 40065, USA.
Tel: 502.232.7600
Fax: 502.633.6100
CCN17213

Greenfield Global USA, Inc.
58 Vale Road, Brookfield,
CT 06804, USA.
Tel: 203.740.3471
Fax: 203.740.3481
CCN17213

Emergency Contact: **CHEMTREC: 1.800.424.9300 (USA) / +1.703.527.3887 (International)**

2. HAZARDS IDENTIFICATION

Emergency Overview:

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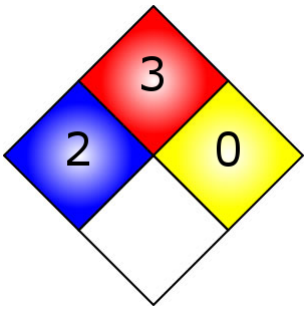
OSHA Hazards:
Flammable liquid, Target Organ Effect, Irritant

Target Organs:
Heart, Liver, Nerves

NFPA



GHS label elements, including precautionary statements

Signal Word:
DANGER!

Hazard statement(s)

H335	May cause respiratory irritation.
H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H370	Causes damage to organs
H315 + H319	Causes skin and serious eye 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.
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)
Eye irritation (Category 2B)
Flammable Liquids (Category 2)
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	May cause irritation including stinging, tearing, and redness.
Ingestion	Ingestion may cause dizziness, faintness, drowsiness decreased awareness or responsiveness, nausea, vomiting, staggering gait, lack of coordination, coma and death.
Inhalation	High vapor concentration may cause burning sensation in nose and throat and stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea and vomiting may also occur.
Skin	Prolonged or widespread contact may result in the absorption of potentially harmful amounts. Inhalation: High vapor concentration may cause burning sensation in nose and throat and stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea and vomiting may also occur. Skin Contact: Prolonged or repeated contact may cause defatting and drying of the skin.
Chronic	Long term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis. Overexposure to methanol may cause eye damage and liver or kidney injury. Other Health Hazards: Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects which together constitute fetal alcohol syndrome. Medical Conditions Aggravated by Overexposure: Repeated exposure to ethanol may aggravate liver injury produced from other causes. Skin contact may aggravate dermatitis.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical identity:	Alcohol
Common name / Synonym:	Denatured Ethanol, Industrial Alcohol
CAS number:	64-17-5
EINECS number:	200-578-6
ICSC number:	0044
RTECS #:	KQ6300000
UN #:	UN1987
EC #:	603-002-00-5

% Weight	Material	CAS
82.2	Ethanol	64-17-5
16.9	Methanol	67-56-1
.87	Methyl Isobutyl Ketone	108-10-1

4. FIRST AID MEASURES

General advice

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Skin

Wash skin with soap and copious amounts of water. Seek medical attention.

Inhalation

Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.

Eyes

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention.

Ingestion

Antidote: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.

Note to Physician

Symptoms vary with alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.05- 0.15 %. Approximately 25% of individuals show signs of intoxication at these levels. Above 0.15% the person is definitely under the influence of ethanol; 50-95% of individuals are clinically intoxicated at these levels. Severe poisoning occurs when the blood is 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.

5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

Carbon oxides expected to be the primary hazardous combustion product.

Special protective equipment and precautions for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

Unusual Fire and Explosion Hazards:

- May produce a floating fire hazard.
- Static ignition hazard can result from handling and use.
- Vapors may travel to source of ignition and flash back.
- Vapors may settle in low or confined spaces.

Alcohols burn with a pale blue flame which may be extremely hard to see under normal lighting conditions. Personnel may only be able to feel the heat of the fire without seeing flames. Extreme caution must be exercised in fighting alcohol fires. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire.

Flammable Properties
Classification
OSHA/NFPA Class IB Flammable Liquid.
Flash point
13 - 16 Â°C (55.4 - 60.8 Â°F) - closed cup
Autoignition temperature
363Â°C (685.4Â°F) - (Ethyl Alcohol)

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions:

Stop leak. Contain spill if possible and safe to do so. Prevent product from entering drains.

Methods and materials for containment and cleaning up:

Absorb with an inert dry material and place in an appropriate waste disposal container. Keep disposal containers closed when finished.

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7. HANDLING AND STORAGE

Precautions for safe handling:

Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge. Open and handle container with care. Metal containers involved in the transfer of this material should be grounded and bonded.

Conditions for safe storage, including any incompatibilites:

Keep container tightly closed in a cool, dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leaks/spills. Consult local fire codes for additional storage information.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters, e.g., occupational exposure limit values or biological limit values:

Occupational Exposure Limits

Component	Source	Type	Value	Note
Ethyl alcohol	US (OSHA)	TWA	1000 ppm / 1,900 mg/m3	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants.
Methyl Alcohol	US (OSHA)	TWA	200 ppm	
Methyl Alcohol	US (ACGIH)	STEL	250 ppm	
Methyl Isobutyl Ketone	US (ACGIH)	TWA	50 ppm	
Methyl Isobutyl Ketone	US (OSHA)	TWA	100 ppm, 410 mg/m3	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants

Appropriate engineering controls:

General room or local exhaust ventilation is usually required to meet exposure limit(s). Electrical equipment should be grounded and conform to applicable electrical code.

Individual protection measures, such as personal protective equipment:

Respiratory protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection:

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Use equipment approved by appropriate government standards, such as NIOSH (US) or EN166 (EU) Maintain eye wash fountain and quick-drench facilities in work area.

Skin and body protection:

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance *(physical state, color, etc.)*	Liquid. Colorless.
Freezing point	-114Â°C (-173Â°F)
Initial boiling point and boiling range	80Â°C (176Â°F)
Flash point	13 - 16 Â°C (55.4 - 60.8 Â°F) - closed cup
Evaporation rate	Specific data not available - expected to be rapid.
Flammability (solid, gas)	Flammable
Upper / Lower flammability or explosive limits	3.3%(V) / 19%(V)
Vapor pressure	44.6mmHg (5.94 kPa)
Vapor Density	1.6 (air =1)
Solubility(ies)	completely soluble
Auto-ignition temperature	363Â°C (685.4Â°F) - (Ethyl Alcohol)
Formula (ETHANOL)	C2H6O
Formula (METHYL ISOBUTYL KETONE)	C6H12O
Fromula (METHANOL)	CH4O
Molecular Weight (ETHANOL)	46.07 g/mol
Molecular Weight (METHANOL)	32.04 g/mol
Molecular Weight (METHYL ISOBUTYL KETONE)	100.16 g/mol

10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	Vapors may form explosive mixture with air.
Conditions to avoid (e.g., static discharge, shock or vibration)	Heat, flames, and sparks. Extreme temperatures and direct sunlight.
Incompatible materials	Strong acids, strong oxidizing agents
Hazardous decomposition products	Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

- Ethyl Alcohol 64-17-5

Signs and Symptoms of Exposure
Central nervous system depression, narcosis, damage to the heart. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Product Summary:
Ethanol is not toxic by OSHA standards. Coingestion of sedative hypnotics or tranquilizers can increase the toxic affects of ethanol.

Acute Toxicity:

LC50 (inhl)	Rat	20000ppm	10hrs
LC50 (Oral)	Rat	7060mg/Kg BWT	
LDLo (Oral)	Human	1400 mg/Kg BWT	

Irritation:

Eyes (ETHANOL)

Eye exposure to Ethanol generally causes transient pain, irritation, and reflex lid closure. A foreign-body sensation may persist for one to two days. Vapors produce transient stinging and tearing, but no apparent adverse effects. Transiently impaired preception of color may occur with acute ingestion or chronic alcoholism. Standard Draize eye test (rabbit) - Dose: 500 mg Reaction: Severe Dose: 500 mg/24 hrs Reaction: Mild

Skin

Standard Draize skin test (rabbit) - Dose: 20 mg/24 hrs Reaction: Moderate Repeated exposure may cause skin dryness or cracking.

Carcinogenicity

IARC: Not classifiable as a human carcinogen.
ACGIH: Not classifiable as a human carcinogen.
NTP: Not classifiable as a human carcinogen.
OSHA: Not classifiable as a human carcinogen.

Other Hazards

Organ	Description
Eyes	Irritating to the eyes. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage.
Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis. Advanced stages can lead to respiratory failure, kidney failure, coma, and death.
Inhalation	Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation.
Skin	Mildly irritating to the skin. May cause dermatitis by de-fatting the skin from prolonged or repeated contact.
Chronic	Prolonged exposure can cause liver, kidney, and heart damage. Long term exposure can cause loss of appetite, weight loss, nervousness, memory loss, mental retardation.

- Methyl Alcohol 67-56-1

Product Summary:

Classification of teratogenicity or reproductive toxicity cannot be determined with available data for this product. No data available to designate the product as causing specific target organ toxicity through repeated exposure. No data available to designate product as an aspiration hazard.

Acute Toxicity:

LC50 (Inhl)	Rat	64,000 mg/Kg BWT	4 hours
LD50 (Oral)	Rat	5,628 mg/Kg BWT	
LD50 (Skin)	Rabbit	15,800 mg/Kg BWT	

Irritation:

Eyes (METHANOL)

Direct contact with the eyes produces a mild, reversible irritation, assuming treatment is initiated promptly. Methanol ingestion or inhalation can lead to visual disturbance that can proceed to blindness.

Skin

Standard Draize skin test (rabbit) - Dose: 20 mg/24 hrs Reaction: Moderate Repeated exposure may cause skin dryness or cracking.

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Other Hazards

Organ	Description
Eyes	Irritating to the eyes.
Ingestion	Poison, may be fatal or cause blindness if swallowed. Cannot be made non-poisonous. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Inhalation	Toxic by inhalation. Vapor harmful. May be irritating to the respiratory tract.
Skin	Toxic in contact with skin. Irritating to skin.
Chronic	Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed. Experiments have shown reproductive toxicity effects on laboratory animals. May cause adverse liver effects. May cause adverse kidney effects.Methanol is slowly eliminated from the body, therefore it can have cumulative toxicity effects with repeated exposures.

- Methyl Isobutyl Ketone 108-10-1

Product Summary:

Laboratory tests have shown teratogenic effects. No data available for the mutagenic or reproductive effects of the product. No data available to designate the product as causing specific target organ toxicity through single or repeated exposure. No data available to designate product as an aspiration hazard.

Acute Toxicity:

LC50 (Inhalation)	Rat	16.4 mg/m3	4 hours
LD50 (Dermal)	Rabbit	> 16,000 mg/kg	
LD50 (Oral)	Rat	2,080 mg/kg	

Irritation:

Eyes (METHYL ISOBUTYL KETONE)
Rabbit - Moderate eye irritation - 24 hours

Skin
Rabbit - skin irritation - 24 hours

Teratogenicity (METHYL ISOBUTYL KETONE)
Methyl Isobutyl Ketone is teratogenic. Fetal death and developmental abnormalities occurred in the babies of mice that inhaled Methyl isobutyl ketone.

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Other Hazards

Organ	Description
Eyes	Can be irritating to the eyes.
Ingestion	Can be harmful if ingested.
Inhalation	Can be harmful, causing respiratory tract irritation, if inhaled.
Skin	Can be harmful, causing irritation, if absorbed through the skin.

12. ECOLOGICAL INFORMATION

- Ethyl Alcohol 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

- Methyl Alcohol 67-56-1

Ecotoxicity (aquatic and terrestrial, where available):
Acute Fish Toxicity (METHANOL)
LC50 / 96 hours Lepomis macrocirus: 15,400 mg/L / LC50 / 96 hours Fathead minnow: 29,400 mg/L

Toxicity to Aquatic Plants (METHANOL)
EC50 / 96 hours Scenedesmus capricornutum: 22,000 mg/L

Persistence and degradability:
This material is expected to be readily biodegradable. There is evidence that it is degraded under anaerobic conditions.

Bioaccumulative potential:
Bioconcentration factor (BCF) of 0.2. This material is not expected to bioaccumulate.

Other adverse effects:
BOD: 600 mg/g - 1120 mg/g COD: 1420 mg/g

- Methyl Isobutyl Ketone 108-10-1

Ecotoxicity (aquatic and terrestrial, where available):
Acute Toxicity to Fish (METHYL ISOBUTYL KETONE)
LC50 / 48 hours Leuciscus idus melanotus- 480 mg/L

Toxicity to Aquatic Plants (METHYL ISOBUTYL KETONE)
EC50 / 48 hours Green algae- 2,000 mg/L

Persistence and degradability:
Biotic/ Aerobic

Bioaccumulative potential:
No data available

13. DISPOSAL CONSIDERATIONS

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:

Vapors may collect in empty containers. Treat empty containers as hazardous. Dispose of spill-clean up and other wastes in accordance with Federal, State, and local regulations.

14. TRANSPORT INFORMATION

Description of waste residues and information on their safe handling and methods of disposal:

UN number	UN1987
UN proper shipping name	Alcohols, n.o.s.
Transport hazard class(es)	3
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.
Marine pollutant: No

IATA
UN-Number: UN1987 Class: 3 Packing Group: II
Proper shipping name: Alcohols, n.o.s.

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question:

OSHA Hazards
Flammable liquid, Target Organ Effect, Irritant

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

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)

Country	Notification +1.703.527.3887 (INT)
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS/ISHL
Korea	ECL
New Zealand	NZIoC
Philippines	PICCS
United States of America	TSCA

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313: Methanol CAS-No. 67-56-1 Revision Date 2007-07-01

SARA 311/312 Hazards
Acute Health Hazard
Fire Hazard

CERCLA
Methanol CAS-No. 67-56-1. RQ: 5,000 lbs

Methyl isobutyl ketone CAS No. 108-10-1 RQ: 5000 lbs

Massachusetts Right To Know Components
Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

Pennsylvania Right To Know Components
Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

New Jersey Right To Know Components
Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

Methanol CAS-No.67-56-1 Revision Date 2007-07-01

California Prop 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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16. OTHER INFORMATION:
INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS

Disclaimer
Greenfield Global USA, Inc. believes that the information on this SDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, Greenfield Global USA, Inc. does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this SDS information may not be applicable. Information is correct to the best of our knowledge at the date of the SDS publication.