SAFETY DATA SHEET

SECTION 1: Chemical And Company Information

Chemical Name: Ethanol **95%**

Other Name: -

Recommended use and restrictions on use:
Resin, Fat, Fatty Acid, Oil, Alkenes Solvent of Hydrocarbons, Extraction Medium, Acetaldehyde Production, Acetic Acid, Ethylene, Succinyl-2-Ethyl-Hexanol, Dye, Pharmaceuticals, Elastomer, Detergent, Surface Coating, Cosmetics, Explosives, Antifreeze agent, Drink, Anti-corrosion, Petroleum alcohol, fermentation medium.

Name, address, and phone of manufacturer , importers or supplier:
SENG FA CHEMICAL BIOTECH CO., LTD.
No.11, Wugong 3rd Rd., Wufeng Dist., Taichung City 413, Taiwan (R.O.C.)
Phone: +886-4-23327555

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SECTION 2: Hazard(s) Identification Information

GHS classification: C2062 Flammable liquids Category 2;
Serious damage / Eye stimulation substance Category 2A

GHS label elements:

Danger

Symbols: Flame, Exclamation mark

Signal word: Danger

Hazard Alarm Statement:

H226 Flammable liquid and vapor;

H319 Cause serious eye irritation

Hazard Precaution Measures:

Keep container tightly closed;

Keep away from fire source – No smoking;

If contact with eyes: Wash with plenty of water and then consult with medical advice and treatment;

Wear goggles and face mask.

Other Hazards: -

SECTION 3: Composition Identification Information

Pure Substance:

Product Chinese/English Name: 乙醇 / Ethanol

Synonymous Name: 酒精、Alcohol, Ethyl Alcohol

CAS No.: 64-17-5
Hazard Composition (percentage): 100 Concentration or concentration range (percentage of ingredients): 95

SECTION 4: First-Aid Measures

First-aid advice and recommendations for different routes of exposure:

Inhalation:

1. Move sufferer away from exposure zone.
2. If no breath, make sure to clean respiratory tract and execute CPR.
3. If difficult breathing, give oxygen.
4. Keep sufferer warm and taking a rest.
5. Visit doctor immediately.

Skin Contact:

1. Wash suffered region with soap and plenty of water.
2. Take off polluted clothing immediately.
3. If continue to have irritation, visit doctor immediately.

Eyes Contact:

1. Wash with plenty of water for more than 15 minutes.
2. Eyelid should be lifted from eyeball to have an indeed thoroughly cleaning.
3. Visit doctor immediately.

Ingestion:

1. If sufferer having clear consciousness, allow sufferer to drink 1-3 cup(s) of water or milk to dilute content in stomach.
2. If sufferer being spontaneously vomiting or inductive vomiting, observe whether difficult breathing happened.
3. Do not induce vomiting to unconscious or semi-convulsion sufferer.
4. Keep sufferer warm and taking a rest.
5. In case of mass ingestion or having GI symptom, visit doctor immediately.

Most important symptoms and hazardous effects:

Irritation. If inhaled into lungs, can cause pneumonia.

Protection of First-aid personnel:

Should wear Class-C protection equipment and execute the first-aid in the safe region.

Notes for physician: -

SECTION 5: Fire-Fighting Measures

Applicable extinguishing media: CO_2, dry chemical powders, alcohol-resistance foam

Specific hazards confronted during fire-fighting:

1. At room temperature, its vapor can mix with air to form flammable or explosive mixtures which might expand tempering.
2. When flew into sewer, it will cause the dangers of fire and explosion.
3. The container may explode if met fire.
4. Its vapor will be accumulated in the closed area.

Specific fire-fighting procedure:

1. Spray water to cool down the container and building which were exposed in fire site and protect personnel.
2. If the leaked substances did not be ignited, ventilate leakage area and spray water to disperse the vapors.
3. Use water to dilute the leaked substances and wash them away from igniting source, avoid to washing into sewer and drinking water system.
4. If having storing tank or tank car in fire site, isolate the area around 0.5 mile.
5. Withdraw and execute fire-fighting at the place with safe distance or being protected.
6. Locate at upwind place to avoid dangerous vapors and poison decomposed substances.
7. Stop leakage before fire-fighting. Allow fire to burn-off if cannot stop leakage and no danger around there. If executing fire-fighting without stopped leakage, vapors will form the explosive mixtures with air and ignite again.
8. Isolate un-fired materials and protect personnel.
9. Under safe condition, move container away from fire-site.
10. Use water fog to cool down the storing tank or container which was exposed in fire-site.
11. Water fog extinguishing may be ineffective unless fire-fighter has been trained for extinguishing various kinds of flammable liquids.
12. If leakage did not be ignited, spray water to disperse vapors and protect personnel who is trying to stop leakage.
13. It will be ineffective to execute fire-fighting by water jet.
14. For large fire in large area, use unmanned water flog controlling frame or automatic shaking extinguishing monitor.
15. Withdraw away from fire-site as far as possible and allow fire to burn-off.
16. Keep away from storing tank.
17. When storage tank safety valve alarmed or changed color due to fire, withdraw immediately.

Specific protective equipments for fire fighters: Fire fighter should wear air respirator, protective gloves and fire-fighting clothing.

SECTION 6: Accidental Leakage/Release Measures

Personal precautions:

1. Restrict personnel access until completely cleaned up the released area.
2. Make sure the cleaning task is executed by trained personnel.
3. Wear suitable personal protective equipment.

Environmental precautions:

1. Make ventilation to the released area.
2. Move away all igniting sources.
3. Inform the relevant Government Occupational Safety & Health & Environment Protection units.

Cleaning method:

1. Keep outsider away from fire-site.
2. Locate at upwind place and do not enter into the lower place.
3. Isolate dangerous area and avoid personnel entering.
4. Prohibit open fire, flame, and smoking in the hazardous area.
5. Contact with supplier or fire fighting agency to seek relevant technical suggestion or help.
6. Stop leakage/release under safe situation.
7. Spray water to reduce vapors.
8. Avoid leaked substance to flow into sewer which may cause danger of firing or explosion.
9. Small amount leakage/release: use sands, nonflammable adsorptive substance, or other known absorptive to absorb them, and then use water to flush the leakage/release area.
10. Large amount leakage/release: Built up containment dike in front of the leakage/release area and then manage them.

SECTION 7: Safety Handling and Storage Measures

Handling:

1. Do not eat, drink, or smoke in the work area.
2. Empty container could contain poison, flammable, and explosive residuals or vapors.
3. Do not cut, grind, drill, weld, or re-use the empty container unless having the capability of suitable prevention from danger.

Storage:

1. Keep storage in tightly closed container.
2. Store at the area of cool, dry, isolated and good ventilation. Keep away from heat, igniting source, incompatible substances.

3. During transportation, use grounded piping and apparatus to reduce the possibility of electrostatic spark ignition or explosion.
4. Do not eat, drink, or smoke in the area of operation or storage areas.
5. Empty container may contain poison, flammable, combustible or explosive residuals or vapors.

SECTION 8: Exposure Prevention Measures

Engineering Control: -

Control Parameters

8 hr Time Weighted Average (TWA)	Short Term Exposure Limit (STEL)	Maximum Allowable Concentration (CEILING)	Biological Exposure Indicators (BEIs)
1000ppm	1000ppm	-	-

Personal protective equipment:

Respiration protection: (1) Below 3300 ppm: Oxygen supply mode respiration protective equipment or comprehensive mode air respirator (self-portable respiration protective equipments); (2) Unknown concentration or IDLH condition: Positive pressure mode comprehensive air respirator or positive comprehensive oxygen supply mode respiration protective equipment and aid mode positive pressure air respirator be used together. (3) Survival escape: escape mode air respirator.

Hand protection: (1) Chemical protective gloves. Its material had better made from butyl-rubber, Viton, or 4H.

Eyes protection: (1) Closed chemical goggles and face mask.

Skin and body protection: (1) apron, hand protection.

Hygiene measures:

(1) After work, take off polluted clothing as fast as possible. The clothing can be re-wear only after washed in clean or discard it. And, should inform the laundry personnel about the hazardous pollution.
(2) Prohibit smoking, eating, or drinking in the work place.
(3) After handled this object, should wash hands thoroughly.
(4) Keep clean of operation site.

SECTION 9: Physical and Chemical Properties

Appearance: colorless, transparent, evaporating liquids	**Odor:** alcohol odor
Odor threshold: 49-716 ppm (detection); 100ppm (notice)	**m.p.:** -114~-114.5℃
pH value: -	**b.p./ b.p. range:** 78.4℃
Flammable (s, l): -	**Flash point:** 13℃
Decomposition Temp.: -	**Testing method:** close cup.
Natural Temp.: 363℃	**Explosion limit:** 3.3% ~ 19%
Vapor pressure: 44.3 mmHg	**Vapor density:** 1.6 (air =1)
Density: 0.789 (water =1)	**Solubility:** soluble with water
Octanol/water distribution coefficient (log Kow): -0.31 ~ -0.32	**Evaporation rate:** 2.4 (Butyl acetate =1)

SECTION 10: Safety and Reactivity

Stability: Stable under normal condition.
Possible hazardous reaction under specific conditions: (1) Oxidants: Possibly drastic reaction; (2) Hydrogen peroxide: its mixture will explode if met heat or shaking; (3) Perchloric acid, silver nitrate, ammonia: may form the mixture which is sensitive to shaking; (4) Alkali metals: Explosive reaction; (5) Acid, aid anhydride: drastic reaction, exothermic.
Must avoid condition: -
Must avoid substances: oxidants, mineral acids, strong acids, strong alkali
Hazardous decomposed products: -

SECTION 11: Toxicological Information

Exposure paths: Inhalation, skin contact, eyes contact, and ingestion.
Symptoms: exciting, intoxicated, headache, dizzy, tire, blurry vision, fatigue, tremor, spasm, lost consciousness, drowsiness, respiratory arrest, hypoglycemia, hypothermia and extensor rigidity; skin might be resulted in degreased, red, itchy, inflamed, and cracked.
Acute toxicity: **Skin:** (1) mild irritation **Inhalation:** (1) may irritate respiratory tract and mucous membrane. (2) may cause hazardous effect of CNS; the symptoms include: exciting, intoxicated, headache, dizzy, tire, blurry vision, fatigue, tremor, spasm, lost consciousness, drowsiness, respiratory arrest, and death.

Ingestion: (1) may cause hazardous effect of CNS; symptoms are as those listed of "inhalation". (2) Serious acute intoxication can cause hypoglycemia, hypothermia, and extensor rigidity. (3) Inhaled into lung can cause pneumonia.

Eyes: Exposed to liquid, vapors, smokes of fog may cause moderate irritation. (2) Direct contact may cause irritation, pain, cornea inflammation, and possible cornea damage.

LD50 (Tested animals, absorption path): 7060 mg/kg (rat, oral)
LC50 (Tested animals, absorption path): 20,000 ppm/10H (rat, inhalation)
20mg/24H (rabbit, skin): caused moderate irritation.
500mg/(rabbit, eyes): caused serious irritation.

Chronic toxicity:

(1) If repetitively or long-term contacted with skins, it might result in degreased, red, itchy, inflamed, and cracked skins and secondary infection.
(2) If long-term contacted with skins, it might result in a few people to have skin allergy reaction.
(3) Ingestion: Chronic intoxication may cause failures of liver, kidney, brain, GI-tract, cardiac muscle.
(4) May cause adverse effect to reproductive ability.
(5) For those had been suffered from liver diseases, hazardous effect could be increased if exposed in it.
(6) Use with other drugs together may cause adverse effect.

In 200 mg/kg (female before mating, in uterus), it will affect female reproductive ability.
In 8 mg/kg (female with 32 weeks pregnancy; iv injection), it will affect the fetal Apgar score (it is the sum-up evaluation value for neonatal heart beating rhythm, respiration, muscle tension, and skin reflex stimulation.

SECTION 12: Ecological Information

Ecological toxicity:
LC50 (fish): 13480mg/l/96H
EC50 (aquatic invertebrates): -
Biological concentrated factor (BCF): -

Persistence and degradability:

(1) When released into water, it will be evaporated and may be decomposed by organisms; unlikely be accumulated in fish body. In natural water, although no

data shown to be decomposed by organisms, however, the experimental data has shown that ethanol can be decomposed rapidly by organisms. (2) When ethanol was released into air, it will be removed by photolysis. The evaluated duration is 4-6 days. In addition, rainfall flushing can clean it. Half-life (air): 12.2 ~ 122 hr Half-life (water surface): 6.5 ~ 26 hr Half-life (underground water surface): 13 ~ 52 hr Half-life (soil): 2.6 ~ 24 hr
Bio-accumulative potential: -
Mobility in soil: When ethanol was leaked into soils, it will be vaporized, bio-decomposed, or infused into underground water.
Other adverse effects: Have high toxicity to aquatic organisms.

SECTION 13: Disposal Consideration methods

Waste disposal method: (1) Refer to relevant treatment methods of regulations.

SECTION 14: Transportation Information

UN No.: 1170
UN Proper shipping name: Ethanol, or Ethanol Solution
Transportation hazard classification: Class III Flammable liquid
Packing type: II
Ocean pollution (Y/N): N
Specific transportation ways and precautions: According to its contained alcohol having not beyond 24% aqueous solution by volume, it is not confined by the regulation of this class.

SECTION 15: Regulation Information

Applicable regulations/Laws:	
1. Occupation Safety and Health Act 3. Standards of Permissible Exposure Limits of Airborne Hazardous Substances in Workplace. 5. Enterprise Wastes Storage Clearance Treatment Methods and Facility Standards.	2. Hazardous Chemicals Labeling and Common Sense Rules. 4. Road Traffic Safety Rules; 6. Public Dangerous Objects and Flammable High-Pressure Gas Installation Standards & safety Management Rules

SECTION 16: Other Information

Reference	1. CHEMINFO Database, CCINFO disc, 2005-2. 2. RTECS Database, TOMES PLUS Disc. Vol.63, 2005. 3. HSDB Database, TOMES PLUS Disc, Vol.63, 2005. 4. ChemWatch Database, 2004-4.	
Table formulation unit	**Name:** SENG FA CHEMICAL BIOTECH CO., LTD. **Address:** No.11, Wugong 3rd Rd., Wufeng Dist., Taichung City 413, Taiwan (R.O.C.) **Phone:** +886-4-23327555	
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Remarks	In the above described information, the symbol " –" means no relevant information currently; while the symbol " /" means this column is not applicable to that substance.	

The above information is commissioned by Occupation Safety and Health Administration, ministry of labor. The individual data and information is only for reference. Please user to judge its availability according to application requirement, especially it should be noticed that: when mixing, it could produce different hazard. Also, according to the Hazardous Chemicals Labeling and Common Sense Rules, provide the necessary safety and health precaution items to the labors.