Number: 107

Section 1. Product and Company Identification

Product name: Ethyl acetate
Synonyms: -
Recommended use and Restrictions on use: Paint and general solvent of plastics, organic synthesis, smokeless gunpowder, pharmaceutical use, synthetic fruit oil.
Manufacturer, Importer, or Supplier: Shiny Chemical Industrial Co., Ltd. Address: No.5, Yeong Gong 1st Rd., Yeong An Dist., Kaohsiung City Telephone: +886-7-8619171 ext. 711~714
Emergency telephone number: +886-7-8619171 ext. 711~714 Fax: +886-7-6222620

Section 2. Hazards Identification

Classification:

1. Flammable liquid, Category 2
2. Severe injury/eye irritant, Category 2A
3. Specific target organ toxicity following single exposure, Category 3

Label elements:

Hazard pictograms: Flame, Exclamation mark

Signal word: Danger

Hazard Statements:

1. Highly flammable liquid and vapor.
2. May cause serious eye irritation.
3. May cause respiratory irritation.
4. May cause drowsiness or dizziness.

Precautionary statements:

1. Keep container in a well-ventilated place.
2. Keep away from sources of ignition - No smoking.
3. Avoid contact with eyes.

Other Hazards: -

Section 3. Composition/Information on Ingredients

Pure substance

Chemical Name: Ethyl acetate

Synonyms: Ethyloleate, Acetic ether, Ethyl ethanoate, Acetic acid ethyl ester, Acetic ester, Acetoxyethane, Ethyl acetic ester
CAS NO. : 141-78-6
Weight: 100%

Section 4. First Aid Procedures

Description of first aid measures:

• Inhalation:

1. If the victim loses consciousness or is unresponsive, the first-aid staff should firstly take personal protective measures to ensure personal safety.
2. Remove the source of contamination, or move the victim to an area with fresh air.
3. If the victim stops breathing, let a trained staff apply artificial respiration immediately. If the victim has a cardiac arrest, apply cardiopulmonary resuscitation (CPR).
4. Seek immediate medical attention.

• Skin contact:

1. Remove the contaminated clothing, shoes and leather accessories (such as watch band, belt).
2. Immediately flush the contaminated area with lukewarm, gently running water for over 10 minutes.
3. If irritation still exists, seek immediate medical attention.
4. The contaminated clothing, shoes and leather accessories have to be completely decontaminated before reuse or discard.

• Eye contact:

1. Rapidly and gently absorb or remove the excessive chemical substances.
2. Distract the eyelids immediately. Flush the contaminated eye with lukewarm, gently running water for 10 minutes.
3. Be careful when flushing. Do not let the flushing water containing contaminated substance flow to the uncontaminated eye.
4. If the irritation persists, seek immediate medical attention.

• Ingestion:

1. If the victim is going to lose consciousness, or has lost consciousness, or has a convulsion, do not feed the victim anything at his/her mouth.
2. Let the victim rinse his/her mouth thoroughly.
3. Do not induce vomiting.
4. Let the victim drink 240~300 mL of water.
5. If the victim vomits naturally, let the victim rinse his/her mouth, and drink water repeatedly.

6. If the victim stops breathing, let a trained staff apply artificial respiration immediately. If the victim has a cardiac arrest, apply CPR. 7. Seek immediate medical attention.
The most Important Symptoms and Hazardous Effects: Severe exposure will cause symptoms of central nervous system restraint, such as shortness of breath, headache, weariness and dizziness.
Protection for emergency personnel: First-aiders must wear Class C personal protective equipment to perform emergency rescue in safe area.
Notes to Physicians: If swallowed by the victim, consider the use of gastric lavage and activated charcoal.

Section 5. Firefighting Measures

Suitable extinguishing media: 1. Carbon dioxide. 2. Dry chemical powder. 3. Alcohol foam.
Special hazards during firefighting: 1. Static spark with sufficient energy can ignite vapor with concentration within explosive range. 2. Being heavier than air, vapor will be transmitted to the distant place, and may cause tempering while there is igniting source. 3. If a closed container is heated, explosion may occur. 4. Concentrated solution may be flammable.
Firefighting procedures: 1. Evacuate, and extinguish the fire from a safe distance or protected area. 2. Stay at the windward side to prevent dangerous vapor and decomposed poisonous things. 3. Before extinguishing the fire, stop any spillage and leakage first. If the spillage and leakage cannot be stopped and there is no immediate danger in the surrounding area, let the fire burn out. If the spillage and leakage is not stopped and fire extinguishing is straight away conducted, the vapor and the air will form an explosive mixture and ignite afterwards. 4. Isolate the unignited material and protect all personnel. 5. Remove the containers from the fire site under safe conditions. 6. Use water fog to cool down the tanks or containers at the fire site. 7. Using water fog to extinguish the fire may be ineffective unless executed by the fire fighters who have been trained for extinguishing different kinds of flammable liquids. 8. If the spillage and leakage is not ignited, spray water fog to disperse the vapor

and protect the personnel attempting to contain the spillage.
9. Using spout to extinguish the fire is ineffective.
10. For large fire in a big area, use unmanned water mist control stand or automatic oscillating fire water monitor.
11. Evacuate from the fire site as fast as possible, and allow the fire to burn out.
12. Stay far away from the storage tanks.
13. Evacuate immediately if the safety valve alarm of storage tank rings or changes its color due to the fire.
14. Personnel not wearing special protective equipment will not be allowed to enter the site.

Protective equipment for firefighters: Fire fighters must wear air respirator, protective gloves, fire fighting clothes.

Section 6. Accidental Release Measures

Personal precautions:
1. Personnel are prohibited from entering the site until the spill area is cleaned up completely.
2. Make sure that the personnel being responsible for the cleaning job are trained.
3. Wear appropriate personal protective equipment.

Environmental precautions:
1. The air in this area should be well ventilated to dispel the leaked gas.
2. Extinguish or remove all flammable sources.
3. Inform the government industrial safety and health unit as well as environmental protection unit.

Methods for cleaning up:
1. Do not touch the leaked material.
2. Prevent the leaked material from entering the sewer, drainage or confined space.
3. Under safety condition, try to prevent or decrease the spillage and leakage.
4. Use sand, soil or other absorbing agent that is non-reactive to the leaked material to contain the leakage.
5. Small spills: Absorb by an absorbing agent that is non-reactive to the leaked material. The contaminated absorbing agent is as hazardous as the leaked material, and should be placed in suitable containers with covers and labels. Wash the spill and leak area with water. Small spillage and leakage can be diluted by copious amount of water.
6. Large spill or leak: Contact fire department, emergency unit and the supplier to ask for help.

Section 7. Handling and Storage

Handling:

1. This material is a flammable and toxic liquid. When being handled, engineering control should be operated, and personal protective equipment should be used. All staff should be appropriately trained on the hazardous nature and safe use of the related material.
2. Remove all ignition sources and stay away from heat and incompatibles.
3. There should be "No Smoking" signs posted in working area.
4. Liquid will accumulate electric charge. Additional design should be considered to increase electric conductivity. For example, all the tanks, transloading containers and hoses should be grounded, and naked metal has to be connected during grounding. In the loading operation, flow speed should be decreased to lengthen the operation time. Increase liquid's staying time in the hose, or conduct low-temperature operation.
5. When blending operation is not undergone in an enclosed system, make sure that equipotential bonding is applied to the blending container, the receiving and loading equipment, and the container.
6. Empty tank, storage container and hose may still have hazardous residue inside. Before they are cleaned up, no welding, cutting, hole drilling or other heating work should be engaged on them.
7. The tank or storage container can be filled up with inert gas to reduce the danger of fire and explosion.
8. The ventilation system used in working area should not produce spark, and the equipment should be of anti-explosive type.
9. Keep aisles and exits clear of obstruction.
10. In storage area and large operation area, consider the installation of spillage, leakage and fire detection system, and appropriate automatic fire-fighting system, or sufficient and useable emergency handling equipment.
11. Avoid producing fog droplet or vapor during operation. Operate in a well-ventilated specific area, and use the minimal amount only. Separate operation area from storage area.
12. If necessary, wear suitable personal protective equipment to prevent contact with this chemical or the contaminated equipment.
13. Do not co-use with the incompatibles (such as strong oxidizer) so as not to increase the danger of fire and explosion.
14. Use compatible material to make storage container. Material allocating has to be done carefully, and no spillage should be made.
15. Do not use air or inert gas to pressurize the container to pour out the liquid.

16. Unless the blending area is isolated by fire-resistant structure; otherwise, do not carry out blending work in the storage area.
17. Use recognized storage container and blending equipment of flammable liquid.
18. Do not pour the contaminated liquid back to the original storage container.
19. Containers should be labeled. Keep the container not in use tightly closed and avoid being damaged.

Storage:

1. Store in a cool, dry, well-ventilated and sunlight unreachable place. Keep the material away from heat, ignition sources, and incompatibles.
2. The storage equipment should be made of fire-resistant materials.
3. The floor should be made of impermeable materials.
4. The entry should be built with a slope or threshold or ditch for the leaked material to be discharged to a safe place.
5. The storage area should be clearly indicated, has no obstacle, and permits entry of specific or trained personnel only.
6. Separate storage area from working area. Keep the material away from elevators, buildings, exits of rooms, or main passages.
7. There should be appropriate fire extinguisher and cleanup equipments around the storage area for clearing spillage and leakage.
8. Regularly inspect whether storage containers have damage or leakage.
9. Inspect whether all the newly purchased containers have suitable labels and whether they are damaged.
10. Storage volume should be limited.
11. Leaked and spilled material should be collected in storage containers made of compatible materials.
12. Storage tanks should be grounded, and have equipotential bonding with other equipments.
13. All the drums storing flammable liquids should be installed with relief valves and vacuum relief valves.
14. Store the material at the temperature suggested by chemical manufacturer or supplier. If necessary, temperature detection alarm should be installed to give warning for excessively high or low temperature.
15. Avoid storage of large volume indoors. Try to store in an isolated fireproof building.
16. The exhaust pipe of storage tank should be installed with flame arrester.
17. Storage tank has to be built on the ground, and its entire base should be sealed to prevent leakage, and surrounded by a protective dike, forming a containment area available to carry the total tank volume.

Section 8. Exposure controls

Engineering controls:

1. Independently use a spark-free and grounded ventilation system.
2. Exhaust vents should have direct access to outdoor environment.
3. Use local exhaustion and ventilation equipment or necessary process confinement to control the amount of droplets or vapor in the air.
4. Provide adequate fresh air to supplement the air exhausted from exhaustion system.

Control parameters			
TWA	STEL	CEILING	BEIs
400 ppm	500 ppm	-	-

Personal protective equipment:

• Respiratory protection:

1. Below 2,000 ppm: Full-face chemical-filtered respiratory protective equipment with organic vapor cartridge, powered air-purified respiratory protective equipment with organic vapor cartridge, gas mask with organic vapor canister, full-face and portable oxygen-supplied or continuous oxygen-supplied respiratory protective equipment.
2. Unknown concentration: Pressured portable respiratory protective equipment, pressured full-face oxygen-supplied respiratory protective equipment supported by pressured portable respiratory protective equipment.
3. Escape: Gas mask with organic vapor cartridge, escape-type portable respiratory protective equipment.

• Hand protection: Impermeable gloves preferably made of 4H, Barricade, Responder, CPF3, Trellchem HPS, Tychem 10000.

• Eye protection:

1. Chemical protective goggles, protective mask.

• Skin and physical protection:

1. Full-body protective overalls made of rubber, working boots, safe showering equipment.

Hygiene measures:

1. Take off the contaminated clothing as soon as the work is done. Wash them well before wearing them again or disposal. The laundry staff should be informed of their hazardousness.
2. Smoking, eating or drinking is strictly prohibited in the working area.
3. After handling of the material, wash hands thoroughly.
4. Maintain cleanliness of the operation site.

Section 9. Physical and Chemical Properties

Appearance: Colorless, clear liquid	Odor: Fruit-like odor
Odor threshold: 1. 6.4~50 ppm (detection) 2. 13.3~75 ppm (recognition)	Melting point: -83~-83.6°C
pH: Neutral	Boiling point/Boiling range: 77°C
Flammability (solid, gas): -	Flash point: -4.4°C
Decomposition temperature: -	Test method: close cup
Auto-ignition temperature: 427°C	Explosion limits: 2.0%~11.5%
Vapor pressure: 73 mmHg	Vapor density: 3.04 (air=1)
Density: 0.902 (20°C, Water = 1)	Solubility: 8.6 g/100 mL (water)
Partition coefficient (n-octanol/water, log K_{ow}): 0.66~0.73	Volatility rate: 6.2 (Butyl acetate=1)

Section 10. Stability and Reactivity

Chemical stability: Stable under ordinary conditions.
Possibility of hazardous reactions: 1. Strong oxidizers (nitrate, perchlorate): Increase the risks of fire and explosion. 2. Strong acids (sulfuric acid, fuming sulfuric acid, chlorosulfonic acid): Produce decomposition reaction, and release heat. 3. Potassium tert-butanolate: Ignitable. 4. Lithium aluminum tetrahydride, 2-chloromethyl furan: May cause explosion.
Conditions to avoid: Spark, static electricity, fire sources, moisture.
Materials to avoid: Strong oxidant, strong acid, potassium tert-butanolate, lithium aluminum tetrahydride, 2-chloromethyl furan.
Hazardous decomposition products: Ethanol, Acetic acid.

Section 11. Toxicological Information

Exposure Route: Inhalation, skin contact, eye contact, ingestion.
Symptoms: Irritation, headache, dizziness, drunken feeling, dryness of skin.
Acute toxicity: • Inhalation: 1. Its vapor will cause irritation to nose, gums and throat. 2. Exposure to it at concentration 400 ppm for 3~5 minutes will cause irritation to human body. 3. Severe exposure will cause symptoms of central nervous system restraint, such as breathlessness, headache, weariness and dizziness. 4. There was a case that a victim using lacquer with 80% of ethyl acetate to paint the inside of truck was dead. The upper respiratory tract, spleen, kidney and lung

of the victim were found tissue congestion. • Skin: No irritation caused. • Eyes: Its vapor and liquid will cause eye irritation, and its vapor at 400ppm will immediately cause irritation. • Ingestion: 1. May cause nausea, vomit, breathlessness, headache, weariness, dizziness and other symptoms of central nervous system restraint. 2. Since it decomposes in the body and forms ethanol, ingestion of copious amount will cause shock and death. • LD_{50} (animal test, entry): 5,600 mg/kg (rat, ingestion). • LC_{50} (animal test, entry): 16,000 ppm/6 hour(s) (rat, inhalation). • 400 mg/24 hour(s) (human, eye): cause irritation.
Chronic / Long-term toxicity: 1. Long-term exposure to the material at concentration 4,200 ~ 13,900 ppm will cause only slight irritation to eyes. 2. Its solution at 10% will not cause skin allergy to general people, but will cause skin allergy to people with allergy. 3. Ethyl acetate will cause long-term harm to the cells of mammals.

Section 12. Ecological Information

Ecological toxicity: 1. LC_{50} (fish): - 2. EC_{50} (aquatic invertebrates): - 3. Bioconcentration factor (BCF): -
Persistence and degradability: 1. Ethyl acetate can be rather easily be biologically decomposed. 2. When released in water, the material is mainly evaporated. • Half-life (Air): 35.3~353 hour(s) • Half-life (Water surface): 24~168 hour(s) • Half-life (Groundwater): 48~336 hour(s) • Half-life (Soil): 24~168 hour(s)
Bioaccumulative potential: Accumulation is unavailable because the material, after entering human body, will be very soon decomposed to be ethanol and acetic acid. The undecomposed ethyl acetate will be secreted in the urine 2 hours after exposure.
Mobility in soil: When ethyl acetate is discharged to the ground, this material is expected to be evaporated or melted to the underwater.
Other adverse effects: -

Section 13. Disposal Considerations

Waste disposal: 1. Refer to the related laws and regulations. 2. Store the wastes to be handled according to the storage conditions. 3. Apply specific incineration or hygienic method of burial.

Section 14. Transport Information

United Nations Number (UN No.): 1173
UN Proper Shipping Name: Ethyl acetate
Transport Hazard classes: 3
Packaging Group: II
Marine pollutant (Yes/No): No
Specific Transport Measures and Precautionary Conditions: -

Section 15. Regulatory Information

Applicable Regulations: 1. Occupational Safety and Health Act. 2. Enforcement Rules of the Occupational Safety and Health Act. 3. Regulations for the Labeling and Hazard Communication of Hazardous Chemicals. 4. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste. 5. Public Hazardous Substances & Flammable Pressurized Gases Establishment Standards & Safety Control Regulations. 6. Standards of Permissible Exposure Limits at Job Site.

Section 16. Other Information

References	1. ChemWatch Database, 2017. 2. European Chemicals Agency (ECHA). 3. National Institute of Technology and Evaluation. 4. GHS in Taiwan.
Created by	Shiny Chemical Industrial Co., Ltd.
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Revision Date	2022/09/01
Notes	The symbol " - " in this sheet indicates no available information; the symbol " / " indicates the information is not applicable to the substance.