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1. Product and Supplier Identification

- A. Product Name : Ethyl Acetate
- B. Recommended Use and Restrictions on Use
- Recommended Use : Solvent(paints, resin, inks, adhesives), Organic synthesis, etc(detergent, synthetic leather)
 - Restrictions on Use : Restrict except for recommended use
- C. Manufacture/Supplier/Distributor Identification
- Company Name : Korea Alcohol Industrial Co.,LTD.
 - Address
 - . Headquarters : 14, Tapsil-ro 35beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, South Korea
 - . Ulsan Office/Plant : 66, Sanggae-ro, Nam-gu, Ulsan
 - Information Service or Emergency Tel. : [Http://www.ka.co.kr](http://www.ka.co.kr) / (+82)031-881-8100, 052-259-4761~2
 - Division : Business Department, Environmental Safety Team

2. Hazards Identification

- A. Classification :
- | | |
|---|--|
| Flammable Liquid | Category 2
(Flash Point < 23°C, Boiling point > 35°C) |
| Serious eye damage/irritation | Category 2 |
| Specific Target Organ Toxicity(Single Exposure) | Category 3 (Respiratory tract irritation) |
| Specific Target Organ Toxicity(Single Exposure) | Category 3 (Narcotic effects) |
- B. Warning
- Label



 - Hazard Communication : DANGER!
 - Label Elements

H225	Highly flammable Liquid and Vapor
H319	Cause eye irritation.
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
 - Terms for Precaution
 - Precaution
 - P210 Keep away from heat/ sparks/ open flames/ hot surfaces. – No smoking
 - P233 Keep container tightly closed.
 - P240 Ground/ Bond container and receiving equipment.
 - P241 Use explosion- proof electrical/ ventilating/ lighting/ equipment.
 - P242 Use only non- sparking tools.
 - P243 Take precautionary measures against static discharge.
 - P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
 - P264 Wash hands thoroughly after handling
 - P271 Use only outdoors or in a well- ventilated area.
 - P280 Wash thoroughly after handling

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- Response

P303+P361+P353 If on skin(or hair) Take off immediately all contaminated clothing
Rinse skin with water/shower.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in

a position comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

P312 Call a POISON CENTER or doctor/ physician if you feel unwell.

P337+P313 If eye irritation persists: Get medical advice/attention.

P370+P378 In case of fire, water spray/ alcohol resistant foam for extinction.

- Storage

P403+P233 Store in a well- ventilated place and keep the container tightly closed.

P403+P235 Store in a well ventilated place. Keep cool.

P405 Store in a secure manner.

- Disposal

P501 Dispose of contents/ container by incineration or recycle.

C. Other

○ NFPA

- Health 1

- Flammability 3

- Reactivity 0

3. Composition

Chemical Name : Ethyl Acetate
Synonyms : Acetic Acid Ethyl Ester
CAS Number : 141- 78- 6

Content(%) :	Name	Trade names and Synonyms	KE NO.	Content (wt%)
	Ethyl Acetate	Acetic acid ethyl ester	KE-00047	99.8 wt%

4. First Aid Measures

A. Eye Contact

Do not rub your eyes.

Immediately flush eyes with plenty of water for at least 15 minutes.

If symptoms develop (redness, irritation, etc.), go to hospital immediately.

If you wear a contact lens, remove the lens first.

B. Skin Contact

Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Laundering enough contaminated clothing before reuse.

Get medical attention immediately.

C. Inhalation

When exposed to large amounts of steam and mist, move to fresh air.

If not breathing, give artificial respiration.

If inhaled, seek medical advice immediately and seek medical notice.

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D. Ingestion

Please be advised by doctor whether induction of vomit is demanded or not.

Rinse your mouth with water immediately.

Get medical attention immediately.

E. Note to Physician

Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. Fire Fighting Measure

A. Suitable(or Unsuitable) Extinguish Media

Dry chemical, carbon dioxide, regular foam extinguishing agent, spray

Avoid use of water jet for extinguishing

Wear fire fighting clothing, fire fighting helmets, fire fighting gear, fire fighting gloves, and respirator when fighting fire.

B. Specific hazards arising from the chemical

Highly flammable liquids and vapors, Violent polymerization may cause fire and explosion.

Vapors can be transferred to the ignition sources of ignition.

May form explosive mixture at or above flash point.

Containers may explode on heating.

Highly flammable : Easily ignited by heat, sparks and flames.

Leaks may present a fire/explosion hazard.

Vapors are explosive at room, outdoors, and at the sewers.

Vapors may form explosive mixtures with air.

Vapors may travel to the source of ignition and backfire.

Inhalation and contact may irritate or burn the skin and eyes.

C. Special protective actions for fire-fighting

Cool containers with plenty of water until the fire has completely extinguished.

Keep unauthorized people away, isolate hazard area and deny entry.

Evacuate immediately if there is sound of the safety device or if the tank becomes discolored due to fire.

Wear appropriate protective equipment if necessary.

Vapor or gas is burned at distant ignition sources can be spread quickly.

Due to the extremely low flash point, irrigating fire extinguishing may be less effective when put out a fire.

6. Accidental release measures

A. Personal Precautions

Ventilate closed spaces before entering.

Be sure to work your way back and evacuate someone holding the wind.

Do not touch spilled material. Stop leak if you can do it without risk.

Handling the damaged containers or spilled material after wearing protective equipment.

Do not direct water at spill or source of leak.

Avoid skin contact and inhalation.

B. Environment Precautions

Prevent runoff and contact with waterways, drains or sewers.

If large amounts have been spilled, inform the relevant authorities.

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C. Methods for cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
Notification to central government, local government. When emissions at least of the standard amount
Dispose of waste in accordance with local regulation.
Appropriate container for disposal of spilled material collected.
- Small leak : sand or other non-combustible material, please let use absorption.
Wipe off the solvent.
Dike for later disposal.
Do not use plastic containers.

7. Handling And Storage

A. Precaution for Handling

- Avoid contact with incompatible materials.
- Get the manual before use.
- Refer to Engineering controls and personal protective equipment.
- Do not handle until all safety precautions have been read and understood.
- Do not inhale the steam prolonged or repeated.
- Avoid contact with heat, sparks, flame or other ignition sources.

B. Conditions for safe storage, including any incompatibilities

- Store in a cool, dry, well-ventilated place.
- Check regularly for leaks.
- Note the substances and conditions to avoid.
- Keep sealed when not in use.
- Caution : Flammables.
- Collected them in sealed containers.

8. Exposure Controls, Personal Protection

A. Control parameters – Occupational Exposure Limits

- Domestic regulation : TWA – 400ppm
- ACGIH : TWA – 400ppm
- Biological exposure standard : Not available

B. Engineering Control

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Personal Protection

- Respiratory protection
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Any chemical cartridge respirator with organic vapor cartridge(s).
 - Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
 - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

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- Eye protection
Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Hand protection
Wear appropriate chemical resistant glove.
- Body protection
Wear appropriate chemical resistant protective clothing.

9. Typical physical and chemical properties

A. Appearance	:	Liquid, Clear, Colorless	※Source : HSDB
B. Odor	:	Sweet odor	※Source : HSDB
C. Odor Threshold	:	3.9 ppm	※Source : HSDB
D. pH	:	No data	
E. Melting point / Freezing Point	:	- 84°C	※Source : ICSC
F. Boiling point	:	77°C	※Source : ICSC
G. Flash point	:	- 4°C(c.c.)	※Source : ICSC
H. Evaporation ratio	:	6.2	
I. Flammable(Solid, Gas)	:	Not applicable	
J. Ignition or Explosion range	:	2.2 / 11.5%	※Source : ICSC
K. Vapor	:	93.2 mmHg (25°C)	※Source : HSDB
L. Solubility	:	6.4g/ 100ml at 25°C(water), Solvent Solubility : Alcohol, Benzene, Ether, Aceton, Chloroform	※Source : HSDB
M. Vapor Density	:	3.0 (Air=1)	※Source : ICSC
N. n-oktanol/ water partition coefficient:	:	0.73 (Log kow)	※Source : ICSC
O. Specific gravity	:	0.9003 (Water=1)	※Source : ICSC
P. Autoignition Temperature	:	427°C	※Source : ICSC
Q. Decomposition Temperature	:	No data	
R. Viscosity	:	0.44cP at 25°C	※Source : HSDB
S. Molecular formular / Weight	:	CH ₃ COOC ₂ H ₅ / 88.11	※Source : ICSC

10. Stability and Reactivity

- | | | |
|--|---|---|
| A. Chemical Stability & Possibility of hazardous reactions | : | This material is stable under recommended storage and handling conditions.
Hazardous Polymerization will not occur. |
| C. Conditions to avoid | : | Avoid contact with incompatible materials and condition.
Avoid contact with heat, sparks, flame or other ignition sources. |
| D. Incompatible materials | : | Not available |
| E. Hazardous decomposition products | : | Not available |

11. Toxicological Information

- | | | |
|---|---|--|
| A. Information on the likely routes of exposure | : | |
| ○ Respiratory tracts | : | The substance can be absorbed into the body by inhalation of its vapour.
※Source : ICSC |

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- Oral : Not available
 - Eye, Skin Contact : Cause eye irritation
- B. Delayed and immediate effects and also chronic effects from short and long term exposure
- Acute Toxicity
 - Oral : LD50 11.3 ml/kg Rat ※ Source : ECHA
 - Dermal : LD50 > 18000 mg/kg (Rabbit) ※ Source : IUCLID
 - Inhalation : Steam LC50 100 mg/l 4 hr Rat
(LC50 = 200 mg/L/1hr) ※ Source : IUCLID
 - Skin corrosive or Irritation : Skin corrosion / irritation test using rabbit, irritation not fully recovered in 7 days. Slightly irritating. Erythema index =1.33, Edema index=0.4, OECD TG 404
※ Source : ECHA
 - Acute eye damages : According to Toxicological Notification, the substance is classified as Category 2 due to severe eye damage / eye irritation. Severe damage / irritation test results(OECD Guideline 405) using rabbits completely relieved within 7 days. No irritant. Conjunctival index : 0.5, iris index : 0.17, Conjunctival edema index : 1.33, Corneal index : 0.67
※ Source : ECHA
 - Respiratory hypersensitivity : No data.
 - Skin hypersensitivity : Skin irritability test using guinea pig females, non-irritant. OECD TG 406
※ Source : ECHA
 - Carcinogenic : Not available
 - Germ Cells Mutagenicity : Results of mutation test(OECD TG 471) on in vitro microorganism showed that regardless of metabolic activity, chromosomal aberration test(OECD TG 473) using negative cultured mammalian cells showed that the metabolism of sister chromatid exchanges in mammalian cells, Negative when there is no active system. Chromosomal aberration(Aneuploidy in Saccharomyces cerevisiae) test in positive test tube when metabolic activity test was carried out, chromosome aberration test(OECD TG 473) using positive test tube mammalian culture cell in absence of metabolic activity test ambiguity in the absence of metabolic activity test in vivo Mortality test result using in vivo mammalian red blood cells.(OECD TG 474). Negative - In vivo micronucleus test results, negative
 - Reproductive Toxicity : Results of 13-week inhalation reproductive toxicity test using rats(Other guideline : US EPA Health Effects Testing Guidelines 40 CFR

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Part 7982450). No effect on sperm count, motility.(NOAEL(P. COCK)=1,500ppm) – Results of inhalation fetal development test using rats(OECD TG 414). Maternal toxicity reduces anesthesia and food consumption(NOAEL(Maternal toxicity) =16,000ppm, NOAEL(Teratogenic)≥20,000ppm, NOAEL(Maternal toxicity) =20,000ppm) (Analogous substance CAS No. 64-17-5)

※ Source : ECHA

- Specific Target Organ Toxicity (single exposure)
Specific Target Organ Toxicity 1 exposure: Causes upper respiratory tract irritation in humans. Exposure to concentrations close to lethal concentrations may cause anesthesia and lung damage. ※ Source : HSDB
 - Specific Target Organ Toxicity (repeated exposure)
As a result of subchronic repeated oral toxicity test using rat arm / water, saliva secretion, irregular breathing and coma were observed in high concentration group. (NOAEL = 900 mg/kg bw/day nominal, NOAEL = 3,600 mg/kg bw/day nominal) – Results of subchronic repeated inhalation toxicity test using rats, respiratory irritation effect LOEC=350ppm, NOEC Human body toxicity=350ppm) (EPA OTS 798.2450, GLP) ※ Source : ECHA
 - Aspiration hazards : No data.
- C. Numerical measures of toxicity (Acute toxicity estimates) : No data.

12. Ecological Information

- A. Ecotoxicity
 - Fish : LC50 230 mg/l 96 hr Pimephales promelas (US EPA method E03-05) ※ Source : ECHA
 - Crustaceans : EC50 2,500 mg/l 24 hr Daphnia magna(other guidelinen: DIN 38412 pt 11)
※ Source : ECHA
 - Algae : No data
- B. Persistence and degradability
 - Persistence : 0.68 log kow (25°C, pH 7, EPA OPPTS 830.7560)
 - Biodegradability : (COD:1.69 g O2/g test mat) ※ Source : ECHA
- C. Bioaccumulation
 - Biodegradability : 69 % 20 day (O2 Consumption)
 - Bioaccumulation : 30 (Pisces, Leuciscusidus melanotus)
※Source : NCIS
- D. Soil mobility : No data
- E. Ozone Hazard : No data
- F. Other hazardous : No data

13. Disposal Considerations

- A. Method of Disposal
Since more than two kinds of designed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process
If water separation is possible, pre-process with Water separation process
Dispose by incineration.

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B. Caution

The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.

Dispose of waste in accordance with all applicable laws and regulations.

14. Transport Information

- A. UN Number : 1173
 B. UN Shipping Name : ETHYL ACETATE
 C. ADR / RID Class : 3
 D. Packing Group : II
 E. Marine Pollutant : Not applicable
 F. EmS code
 Fire : F- E
 Spill : S- D

15. Regulatory Information

- A. Occupational Safety and Health Law
 Working environment measurement materials : Ethyl Acetate (Cycle : 6 month),
 Exposure standard setting materials : Applicable (Ethyl Acetate)
 Managed Hazardous Materials : Ethyl Acetate
 Special medical examination material : not applicable
 Manufacture Restriction Materials : not applicable
 Need Permission Materials : not applicable
 Need PSM Materials : Product, applicable(Flammable liquids)
- B. Toxic Chemicals Control Law
 Toxic Materials : Ethyl Acetate
 Emission Survey Materials : Applicable (Ethyl Acetate)
 Accident Prepare Materials : Applicable (Ethyl Acetate)
 Restriction Materials : not applicable
 Permission Materials : not applicable
 Prohibition Materials : not applicable
 Related Law For Chemicals Registration, evaluation : Existing Chemicals
 (Ethyl Acetate, Water)
- C. Hazardous Safety Control Law : 4 class Petroleum (insoluble liquid), 200 liter
- D. Wastes Control Law : **Classify according to the characteristics of the waste and dispose of it in accordance with applicable regulations of the Waste Management Act.**
- E. Other regulation and foreign regulation.
 Persistent Organic Pollutants Control Law : Not application
 EU Regulations
 - Classification results : Flam. Liq. 2 STOT SE 3 Eye Irrit. 2
 - Hazard Phases : H225 H319 H336
 - Precaution Phases : not applicable
 US Regulations2
 - OSHA Regulation (29CFR1910.119) : Not application
 - CERCLA 103 Reulation (40CFR302.4) : 2267.995(kg) 5000(lb)
 - EPCRA 302 Regulation (40CFR355.30) : Not application

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- EPCRA 304 Regulation (40CFR355.40) : Not application
- EPCRA 313 Regulation (40CFR372.65) : Not application
- Rotterdam Convention : Not application
- Stockholm Convention : Not application
- Montreal Protocol : Not application

16. Other Information

- A. References : This MSDS is prepared in accordance with Article 41 of the Industrial Safety and Health Act and Article 2016-19 of the Ministry of Employment and Labor (standards on the provision of material safety data).
- MSDS of " Korea Occupational Safety and health Agency"
TOXNET, U.S. National Library of Medicine
International Chemical Safety Cards(ICSC)
ECS- ESIS(European chemical Substances Information System)
IUCLID Chemical Data Sheet, EC- ECB
Chemical substances Information System, National Institute of Environmental Research
Korea Information System for Chemical Safety Management
ECHA, HSDB
- B. Original Preparation Date : 2010, 5, 7
- C. Revision number and Revision date : 5 / 2017, Jan. 23.
6 / 2017, Mar. 14. - Application Of NO.2016-19 Revised Regulation(2016, April, 6. MOEL Notice)
7 / 2017. Aug. 2 - Revised MSDS in Korea Safety and Health Corporation
8 / 2019. Mar. 14 - Review the revision of the MSDS provided by the Occupational Safety and Health Agency for different item identifications.
9 / 2020. Mar. 11 - Review the revision of the MSDS provided by the Occupational Safety and Health Agency for different item identifications.
10 / 2020. April. 01 - Ulsan factory addres added by customer request
11 2020. July. 07 - Regulation amended by the Waste Management Act by customer request
- D. Other No data : This information is based on current available DB to protect workers' health, environment and safety.