


Number: 004

Section 1. Product and Company Identification

Product name: Isobutyl alcohol
Synonyms: -
Recommended use and Restrictions on use: Organic synthesis; inert solvent of paint and lacquer; medium of amino resin paint; replacer of n-butanol; paint remover; Fluorescence; high performance liquids chromatography (HPLC); liquids concentrate of fruit essence.
Manufacturer, Importer, or Supplier: Shiny Chemical Industrial Co., Ltd. Address: No.5, Yeong Gong 1 st Rd, Yeong An Dist., Kaohsiung 82841, Taiwan, R.O.C. Telephone: +886-7-8619171 ext. 711~714
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Section 2. Hazards Identification

Classification: 1. Flammable liquids: Category NO.3 2. Acute toxicity (Oral): Category NO.5 3. Skin corrosion/irritation: Category NO.2 4. Serious eye damage/eye irritation: Category NO.1 5. Specific target organ toxicity following repeated exposure: Category NO.3
Label elements:  Hazard pictograms: Flame, Exclamation mark, Corrosion Signal word: Danger Hazard Statements: 1. Flammable liquid and vapour. 2. Harmful if swallowed. 3. Causes skin irritation. 4. Causes serious eye irritation. 5. May cause respiratory irritation. Precautionary statements: 1. Keep away from sources of ignition - No Smoking. 2. Keep containers in a well-ventilated place.

3. Avoid contact with eyes.

Other Hazards: -

Section 3. Composition/Information on Ingredients

Pure substance

Chemical Name: Isobutyl Alcohol

Synonyms: Isobutanol, 2-Methyl-1-propanol, Isopropyl carbinol,
1-Hydroxymethylpropane

CAS NO. : 78-83-1

Weight: 100%

Section 4. First Aid Procedures

Description of first aid measures:

- Inhalation:
 1. Remove to fresh air.
 2. Get medical attention immediately.
- Skin contact:
 1. Wash skin with water for at least 5 minutes if irritation develops.
 2. Get medical attention if irritation develops or persists.
- Eye contact:
 1. Immediately lift eyelids, flushing eyes with plenty of water for at least 20 minutes.
 2. Don't let that water contaminate other sites.
 3. Get medical attention immediately.
- Ingestion:
 1. Never give anything by mouth to an unconscious person.
 2. Have victims gargle thoroughly with clear water.
 3. Don't induce vomiting.
 4. Have victim drink 240 ~ 300ml of water to dilute material in stomach.
 5. If vomiting occurs, lean victim forward and repeat administering water.
 6. If breathing stops, have trained personnel administer artificial respiration. Administer cardiopulmonary resuscitation (CPR) immediately if the heart has stopped.
 7. Get medical attention immediately.

The most Important Symptoms and Hazardous Effects: Central nervous system depression.

Protection for emergency personnel: Use appropriate personal protective equipment such as class C clothing to take first aid in a safety area.

Notes to Physicians: If swallowed, consider gastric lavage and activated carbon.

Section 5. Firefighting Measures

Suitable extinguishing media: Extinguish with carbon dioxide, dry chemical and alcohol-type foam to ignite again.

Special hazards during firefighting: Stop leaks before extinguishing. Spilled vapors may form an explosive mixture with air.

Firefighting procedures:

1. Let it burn if leaks cannot be stopped and not harm environments.
2. Move the containers away from the fire scene in safety situations.
3. Because of low flash points, it may be invalid to fight the fire with water mist. Spray water mist to absorb steam and cool containers in the fire scene. Under suitable condition, experienced personnel can use water mist to extinguish.
4. At big fire should use water mist to rescue by automatic hosepipes or waterproof aims. If not feasible, should retreat and let it burn.
5. If fire cause safety valve alarm or tank change color, personnel should evacuate immediately.

Protective equipment for firefighters: Extinguishing staffs should wear an approved/certified respirator, splash goggles, and firefighting coats.

Section 6. Accidental Release Measures

Personal precautions:

1. Restrain personnel from close to spilled areas before totally cleaning out.
2. Confirm the cleaning work be responsible by trained staffs.
3. Wear appropriate personal protective equipments.

Environmental precautions:

1. Supply adequate protective apparatus and ventilation equipments.
2. Remove heat sources and flames.
3. Report to governmental safety and hygiene institutes and related units.

Methods for cleaning up:

1. Don't touch spilled material.
2. Try to stop or reduce leaks with safety permission.
3. Avoid leaks to flush to sewer or confined space.
4. Use sand, soil, and inert absorbing agents to block leak.
5. Small spill: use the material, not react with spill, to absorb. Contaminated absorbing agents have same risk as spill. Place in covered and labeled containers. Spray water on spilled areas. Use plenty of water to dilute small spill.
6. Large spill: contact fire control, urgent handling units and suppliers to seek aid.

Section 7. Handling and Storage

Handling:

1. This material is flammable and toxic liquid. Engineering control should be applied and make the best use of use personal protective equipments when handling. Educate risk of this material and safety training of use.
2. Remove all ignition sources away from heat and incompatible substances.
3. There should be a "No smoking" sign in workspace.
4. The liquids will accumulate the electric charge. Consider extra design to increase electric conductance. All barrels, containers, and pipelines must have earth connection and contact with naked metal. While transporting and operating, reduce velocity flow, increase operating time to elevate the time that the liquids stays in pipeline, or operate at low temperature.
5. When the operation of allocation is not in the airtight system, insure allocating containers, received-transporting apparatus and containers connected with same electric potential.
6. Empty tanks, containers, and pipelines may have risk residuals. Don't weld, cut, drill or do other heat work before clearing up.
7. Barrels or storage containers can be filled with the inert gas to reduce fire and explosion.
8. Use spark-resistant ventilation system in workplace. Apparatus should be the explosion-proof type.
9. Keep sidewalks and exports unimpeded.
10. Storage and large operating areas are considered to install fire and spill detection system, and appropriate automatic fire-fighting system or enough and useful emergency apparatus.
11. Avoid mist or vapors. Operate in well-ventilated assigned place and adopt the minimum consumption. Separate operation and storage areas.
12. Wear appropriate personal protective equipments to avoid contacting with this chemical or contaminated apparatus if necessary.
13. Don't use with incompatible substances to avoid increasing risk of fire and explosion.
14. Use storage containers made of compatible substances. Package carefully to avoid spray out.
15. Don't use air or inert gas to pressurize and transport liquids from containers.
16. Unless allocating areas isolated with the fire-resistant structure, don't allocate and work in storage areas.
17. Use approved storage containers of flammable liquids and allocating apparatus.
18. Don't pour contaminated liquids back to original storage containers.
19. Containers should be labeled, confined and prevented from damage while not using.

Storage:

1. Store in shady, cool, dry, and well-ventilated place that sunshine cannot directly illuminate, and keep away from heat, ignition sources, and incompatible substances.
2. Storage apparatus should be constructed with the refractory materials.
3. The floor should be constructed with the impermeable materials to avoid absorbing from the floor.
4. Set slope, doorsill or dig grooves in an entrance to discharge spill to safe places.
5. Storage areas should be labeled clearly with no barriers. Permit assigned or trained personnel to enter.
6. Keep storage areas away from workspace, lifts, building, room exits, and main passages.
7. Have appropriate fire extinguisher and leak cleaning apparatus near storage areas.
8. Check containers regularly whether damage or leak.
9. Check all new containers whether appropriately labeled and no damage.
10. Limit storage.
11. Store spill in containers made of compatible substances.
12. Storage tanks have earth connection and connected with other apparatus by using same electric potential.
13. Install depressurizing and vacuum releasing valves in all barrels stored flammable liquids.
14. Store in accordance with the storage temperature suggested by chemical manufacturers or suppliers. Install warm-detecting sirens if necessary to alarm temperature is too high or too low.
15. Avoid storing large amount in room. Store in fireproofing isolating building as possible.
16. Install flame-extinguishing devices in storage exhaust pipes.
17. Must be ground storage tanks. Seal whole area on the bottom to avoid seepage surrounded with liquids dikes, which can block the whole capacity.

Section 8. Exposure controls

Engineering controls:

1. Local exhaust or general ventilation systems.
2. Use spark-resistant and earth-connection ventilation system separately.
3. Direct outside exhaust vents.
4. Supply adequate fresh air to replenish the exhausted air.

Control parameters

TWA	STEL	CEILING	BEIs

50 ppm	75 ppm	-	-
Personal protective equipment: <ul style="list-style-type: none"> • Respiratory protection: <ol style="list-style-type: none"> 1. Below 500 ppm: Chemical type with organic vapor filters or air-feed type respiratory protective equipments. 2. Below 1,250 ppm: Stable flow, air-feed type or dynamical type with organic vapor filters respiratory protective equipments. 3. Below 1,600 ppm: Chemical type with organic vapor filters, full-mask type with organic vapor filters, full- type (portable), or full- and air-feed type respiratory protective equipments. • Hand protection: Use seepage-proof gloves of butyl rubber, rubber-like, Viton, Responder, etc. • Eye protection: Chemical safety goggles, full-type masks. • Skin and physical protection: Above rubber coveralls, work boots. 			
Hygiene measures: <ol style="list-style-type: none"> 1. Remove contaminated clothing quickly as possible after work. Clean clothing before reuse or abandon. Tell cleaning staffs the harmfulness. 2. Forbid smoking or eating in workplace. 3. After handling this material, wash hands thoroughly. 4. Keep workplace clean. 			

Section 9. Physical and Chemical Properties

Appearance: Colorless liquid	Odor: Sweet mold odor
Odor threshold: <ol style="list-style-type: none"> 1. 0.66 ~ 40 ppm (monitor) 2. 1.8 ~ 53 ppm (censor) 3. 100 ppm (irritate) 	Melting point: -108°C
pH: -	Boiling point/Boiling range: 108°C
Flammability (solid, gas): -	Flash point: 28°C
Decomposition temperature: -	Test method: close cup
Auto-ignition temperature: 415°C	Explosion limits: 1.7% ~ 10.6% (51°C)
Vapor pressure: 8.8 mmHg (20°C)	Vapor density: 2.6 (air=1)
Density: 0.8 (Water = 1)	Solubility: 9.8 g/100 mL water
Partition coefficient (n-octanol/water, log K _{ow}): 0.65	Volatility rate: 0.82 (N-butyl acetate=1)

Section 10. Stability and Reactivity

Chemical stability: Stable under ordinary conditions.
Possibility of hazardous reactions:

1. Oxidizing agents (nitrate, per chlorate, per oxidative substances): Increase fire and explosion risk.
2. Chromium trioxide: Strong oxidation can cause fire.
3. Barium permanganate, chlorine, ethylene glycol, isocyanate, hydrogen peroxide, sulfuric acid, hydrochloric acid, nitrogen teraoxide; Mixed explosion.

Conditions to avoid: Static, spark, heat, naked lights, and ignition sources.

Materials to avoid: Oxidizing agents, chromium trioxide, barium permanganate, chlorine, ethylene glycol, isocyanate, hydrogen peroxide, sulfuric acid, hydrochloric acid, nitrogen teraoxide.

Hazardous decomposition products: -

Section 11. Toxicological Information

Exposure Route: Skin, inhalation, ingestion, eye.

Symptoms: Irritation, headache, dizziness, tiredness, and nausea.

Acute toxicity:

- Inhalation:
 1. The vapors will irritate the nose and throat.
 2. High concentrations can irritate nose, throat, and respiratory tracts seriously, induce cough and dyspepsia, depress central nervous system, cause nausea, vomiting, Headache, dizziness, even may lose consciousness.
- Skin: Mild irritation.
- Eyes:
 1. High-level vapors may cause irritation.
- Ingestion:
 1. Depress central nervous system, and cause nausea, vomiting, stomachache, chest pain, headache, faintness, and dizziness.
 2. Exceeding dose may cause coma, even death.
 3. May damage liver and kidney.
- LD₅₀ (animal test, entry): 2,460 mg/kg (rat, oral).
- LC₅₀ (animal test, entry): -
- 20 mg/24 H (rabbit, skin): Cause moderate irritation.
- 2 mg/24 H (rabbit, eyes): Cause severe irritation.

Chronic / Long-term toxicity:

1. Extreme long exposure will damage nervous system and cause symptoms of nausea, dizziness, and vomiting.
2. Long-term contact with skin may induce skin rosy, dry, peeling, and cause dermatitis.

Section 12. Ecological Information

Ecological toxicity: 1. LC ₅₀ (fish): - 2. EC ₅₀ (aquatic invertebrates): - 3. Bioconcentration factor (BCF): -
Persistence and degradability: 1. Monitor sewer water, silt or both of them mixed with soil and surface water in the lab, which degrade quickly. 2. When released into the water, this material is expected to evaporate and biodegrade. 3. When released into the air, this material is expected to being readily degraded by reaction with photochemically produced hydroxyl radicals. <ul style="list-style-type: none"> • Half-life (Air): 9.96 ~ 99.6 hours • Half-life (Water surface): 43 ~ 173 hours • Half-life (Groundwater): 86 ~ 346 hours • Half-life (Soil): 43 ~ 173 hours
Bioaccumulative potential: Quickly to metabolize and eliminate via urine, not accumulate in the body.
Mobility in soil: When released into the soil, this material is expected to evaporate and permeate through soil.
Other adverse effects: -

Section 13. Disposal Considerations

Waste disposal: 1. Consult references to regulations. 2. Waste must be disposed of in accordance with warehousing conditions. 3. Adopt particular incineration or sanitary burying.
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Section 14. Transport Information

United Nations Number (UN No.): 1212
UN Proper Shipping Name: Isobutyl Alcohol
Transport Hazard classes: 3
Packaging Group: III
Marine pollutant (Yes/No): No
Specific Transport Measures and Precautionary Conditions: -

Section 15. Regulatory Information

Applicable Regulations: 1. Occupational Safety and Health Act. 2. Regulations for the Labeling and Hazard Communication of Hazardous Chemicals.

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| <ol style="list-style-type: none"> 3. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste. 4. Standards of Permissible Exposure Limits at Job Site. 5. Public Hazardous Substances & Flammable Pressurized Gases Establishment Standards & Safety Control Regulations. 6. Regulations Governing Designating and Handling of Priority Management Chemicals. |
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Section 16. Other Information

References	<ol style="list-style-type: none"> 1. CHEMINFO database, 2016. 2. ChemWatch database, 2016 3. European Chemicals Agency (ECHA) 4. National Institute of Technology and Evaluation.
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Notes	The symbol " - " in this sheet indicates no available information; the symbol " / " indicates the information is not applicable to the substance.