## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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| **Product name:** Acetone |
| **Other name:** - |
| **Effective date: October 30,2023** |
| **Recommend use / limitation:** Chemicals (textile solvents of cellulose acetate such as methyl isobutyl ketone, methyl isobutyl methanol, isobutylene, methyl, paint, shellac, enamel, etc.) cleaning and purifying of precision instruments; solvents of potassium iodide and potassium permanganate; de-brightener of cellulose acetate; specification test for vulcanized rubber products. |
| **Name of manufacturer or supplier:**<br>SHRINE CHEMICALS, UNITED ARAB EMIRATES |
| **Emergency telephone number/Fax number:** +97148806072 |

## 2. HAZARDS IDENTIFICATION

**Classification:** Flammable liquid Class 2, Substance corrosive/ irritating to skin Class 3, Substance causing serious eye damage / irritation Class 2, Hazardous substance if inhaled Class 2

**Designation content:**

**Symbolic symbols:**

**Warning:** DANGER

**Hazard warning messages:**

Highly flammable liquid and vapor.

Causes minor skin irritation.

Causes eye irritation.

Harmful if swallowed or entering the respiratory tracts.

**Hazard preventive measures:**

Place the container in a well-ventilated area

Keep away from ignition sources – no smoking

In case of eye contact, immediately flush with plenty of water, then seek medical attention.

**Other hazards:** -

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

**Pure substance**

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| **Chinese/English Name:** Acetone |
| **Synonym name:** Dimethyl formaldehyde, Dimethylketal, Dimethyl ketone, Ketone propane, beta-Ketopropane, Methyl ketone, 2-Propanone, Pyroacrtic acid, Pyroacetic ether |
| **CAS No:** 67-64-1 |
| **Hazardous composition (percent):** $C_3H_6O$ 99.5% |

## 4. FISRT AID MEASURES

First aid measures for different exposures:

**Inhalation:**

1. Move away the contaminating source or move the victim to fresh air.
2. If the symptoms persist, immediately seek medical attention.

**Skin contact:**

1. Gently wash the contaminated area with lukewarm water for 5 minutes or continue washing until contaminant is washed off.

**Eye contact:**

1. Immediately hold eyelids open and flush eyes with slow-moving lukewarm water for 20 minutes or continue flushing until the contaminant is flushed out.
2. Avoid clean water flowing in the unaffected eye.
3. Immediately obtain medical attention.

**Ingestion:**

1. If the victim is about to lose consciousness or has lost consciousness or is in spasm, do not feed the victim anything.
2. If the victim is conscious, give him/her water to rinse his/her mouth.
3. Do not attempt to induce vomiting.
4. Let the victim drink 240 – 300 ml of water.
5. Immediately obtain medical attention.

**Most critical symptom and hazard effect:** If concentration is higher than 2000 ppm, it may cause drowsiness, nausea, vomiting, a drunken feeling and dizziness.

**Protection for first aid personnel:** Wear Class C protective equipment and perform first aid in a safe area.

**Notes to physicians:** In case of swallowing, consider gastric lavage with perfusion of activated charcoal.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:** Dry chemical, Alcohol-resistant foam, Carbon dioxide.

**Special hazards during fire fighting**:

1. This liquid is very flammable and can be ignited at room temperature.
2. Vapors are heavier than air and may travel far away to an ignition source and flash back.
3. It will accumulate in a confined area.
4. The container can break or explode when exposed to fire.
5. Solution diluted with water can also be ignited.

**Special fire fighting procedure:**

1. Evacuate to a safe distance or a protected area to fight the fire.
2. Stay upwind to avoid dangerous vapors and toxic decomposition products.
3. First stop leaking before fighting fire. If it is impossible to stop leaking, and no dangerous goods are around, let the fire burn out. If you fight the fire without stopping the leaking, vapors may form an explosive mixture with air then be ignited again.
4. Isolate unburned objects and protect personal safety.
5. If safe to do so, move containers away from fire.
6. Spray water to cool storage tanks or containers exposed to fire.
7. Aside from firefighters who have been trained on each kind of flammable liquid, water spray may not be effective for fighting the fire.
8. If leaks are not ignited, spray water to dissipate vapors and also protect the people attempting to stop the leaking.
9. Water jet is not effective for fighting the fire.
10. For a large fire in a large area, use unmanned hose holders or automatic swaying water nozzles.
11. If possible, evacuate from the fire and let fire burn out.
12. Stay away from the storage tanks.
13. Immediately evacuate once the safety valve of the storage tank sounds or is discolored because of fire.
14. Persons not wearing special protective equipment are not permitted to enter.

**Special protective equipment for firefighters:** Firefighters must wear respirator, firefighting clothing, and protective gloves.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:**

1. Restrict people from entering the spilled area before it has been fully cleaned.
2. Make sure that cleaning is handled by trained personnel.
3. Wear suitable personal protective equipment.

**Environmental precautions:**

1. Use local exhaust and ventilation at the spilled area.
2. Remove all ignition sources.
3. Notify government's vocational health and environmental protection related units

**Method for cleaning up:**

1. Do not touch any runoff.
2. Avoid runoff to sewers, ditches or confined spaces.
3. Make an attempt to stop or reduce leaks, if safe to do so.
4. Use sorbents such as sand and earth that do not react with leaks to block spills.

For small leaks: take up leaks with inactive sorbents. Contaminated sorbents and leaks are equally hazardous and should be kept in a suitable container with a cover and clear label. Flush the spilled area with water. Very small leaks may be diluted with plenty of water.

For large leaks: notify the local fire department, emergency response unit and the supplier for assistance.

## 7. HANDLING AND STORAGE

**HANDLING:**

1. This substance is a flammable and toxic liquid. Implement engineering controls when handling this substance and wear personal protective equipment. Working people should have suitable training on the dangers and safe usage of this substance.
2. Remove all ignition sources away from heat source, and incompatible substances.
3. There must be "No Smoking" signs in the working area.
4. Every tank, transfer container and pipeline must be grounded with direct contact of stripped ground wire.
5. When blending operation is not carried out in a confined system, make sure the container used for blending and the transmission equipment is connected with equal potential.
6. Empty tank, container and pipeline may still have hazardous residues, and therefore no welding, cutting, drilling or any hot work is permitted before they are cleaned.
7. Tanks and storage containers can be filled with inert gas to reduce risk of fire or explosion.
8. Use only the ventilating system that will not generate sparks in the working area. Equipment should be of the explosion-proof type.
9. Keep aisles and exits clear.
10. In the storage area and a large operational area, consider installing a leak and fire detecting system and a suitable automatic fire-fighting system or applicable emergency handling equipment with sufficient capacity.

11. Avoid generation of mist drops or vapors during operation. Operate and use the minimum quantity in the designated area with good ventilation. The storage area should be separated from the operational area.
12. Where necessary, wear suitable personal protective equipment to avoid contact with chemicals or contaminated equipment.
13. To prevent risk of fire or explosion, do not use with incompatible substances (e.g. strong antioxidant).
14. Use storage containers made of compatible materials only. When de-bulking, be careful not to spill.
15. Do not deliver liquid from the container pressurized with air or inert gas.
16. Unless the blending area can be isolated with fire-resistant materials, do not perform blending in the storage area.
17. Use only approved containers and blending equipment for flammable liquid.
18. Do not pour contaminated liquid back in the original storage container.
19. The container must be labeled. Keep the container closed tight when not in use and avoid damage.

**STORAGE:**

1. Store in a cool, dry and well-ventilated place. Store away from direct sunlight, heat sources, ignition sources and incompatible substances.
2. Consider installation of leak and alarm equipment in the storage area.
3. Storage equipment should be constructed with fire-resistant materials.
4. The storage area must use the ventilation system that will not generate sparks and approved explosion-proof equipment and safe electrical system.
5. The floor should be constructed with impervious materials to avoid absorption.
6. Build a slope or threshold or dig a ditch at the entrance of the storage area to lead leaks to a safe place.
7. The storage area should have clear designation, have no obstacles, and allow only authorized or trained people to enter.
8. The storage area should be separated from the working area, away from the elevator, building, room exit, and nothing should be stored in the main hallway.
9. There should be fire extinguishers or spills cleanup equipment installed near the storage area.
10. Regularly inspect storage containers for any leak or damage.
11. Check that all newly arrived containers are properly labeled and are not damaged.
12. Store only a limited volume.
13. Keep collected leaks with containers made of compatible materials only.
14. The storage tank must be grounded and be connected with other equipment with equal potential.
15. Small volume of substance can be stored in an approved explosion-proof refrigerator. Empty

drums may still have hazardous residues and must be sealed and stored separately.
16. All drums used to store flammable liquid must be equipped with a pressure-release valve and a vacuum-release valve.
17. Store at the recommended storage temperature by the chemical manufacturer or the supplier. Where necessary, a temperature detecting alarm should be installed to alert the temperature condition (too high or too low).
18. Avoid storing large volumes of substance indoors. If possible, store in an isolated fire-resistant building.
19. A flame arrester should be added to the vent of the storage tank.
20. The storage tank should be placed on the ground and the whole bottom area should be sealed to prevent leakage. Around the storage tank there should be a dike to confine the whole storage volume.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**ENGINEERING CONTROLS:**

1. Use a ventilation system that will not generate sparks and is grounded; it should be separated from other ventilation systems.
2. The discharge vent runs directly outdoors.
3. Supply sufficient fresh air to supplement air being exhausted.

| Control parameters | | | |
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| TLA-TWA | TLA-STEL | TLA-C | BEIs |
| 750 ppm | 937.5 ppm | --- | Acetone in urine 100mg/L(Ns) |

**PERSONAL PROTECTIVE EQUIPMENT:**

**Respiratory protection:**

1. Less than 2500 ppm: Chemical cartridges with organic vapor cartridges, power air clarifying type, supplied air, self-contained breathing apparatus.
2. Unknown concentration: positive pressure type self-contained breathing apparatus, positive pressure fully–faced respirator supplemented with positive pressure self-contained breathing apparatus.
3. Escaping: Gas mask with an organic vapor cartridge, escaping type self-contained breathing apparatus.

**Hand protection:**

1. Impervious gloves preferably made of materials: Butyl rubber, Teflon. 4H, Barricade,

Chemrel, Responder, Trellchem, and Tychem 10000.

**Eye protection:**

1. Chemical splash-proof goggle, Mask (8" as minimum limit).

**Skin and body protection:**

1. Coverall type protective clothing made of above-mentioned same materials, safety shoes, eye washer, and emergency shower equipment.

**Hygiene practices:**

1. Remove contaminated clothing after work as soon as possible. Do not reuse it before it is washed clean, or discard it. Inform the laundry washing people of contaminant hazard.
2. Smoking and eating or drinking is strictly prohibited in the working area.
3. Thoroughly wash hands after handling this substance
4. Always keep the working area clean.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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| **Appearance:** Colorless, clear liquid | **Odor:** Special sweetness, mint flavor |
| **Odor threshold:** 3.6 – 653 ppm (with detection)<br>33 – 699 ppm (with smelling) | **Melting point:** -94.6°C |
| **pH：**- | **Boiling Point/ range:** 56.2°C |
| **Flammability:** (solid, gas) - - | **Flash point:** -18°C |
| **Decomposing temperature:**- | **Test method:** Closed cup |
| **Autoignition temperature:** 465°C | **Explosion limits:** 2.5 % ~12.8% |
| **Vapor pressure:** 180 mmHg | **Vapor density:** 2 (Air=1) |
| **Density:** 0.791($H_2O$=1) | **Solubility:** Fully soluble in water |
| **Octylalcohol / water partitioning coefficient** (log Kow): -0.24 | **Evaporation rate:** 5.6 (n-Butyl acetate =1) |

## 10. STABILITY AND REACTIVITY

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| **Stability:** Stable at normal condition. |
| **Hazardous reaction under special condition:**<br>1. Oxidants (e.g. peroxide, nitrate, perchlorate); mixtures of strong reductant and chloride solvent with bases (e.g. chloroform, sodium hydroxide): Violent reaction increases risks of fire and explosion.<br>2. Potassium ter-butanolate, hexachloromelamine, sulfur cichloride: Strong reaction. |
| **Conditions to be avoided:** Spark, open flame, heat, ignition source, heated by long-term exposure. |
| **Substances to be avoided:** Oxidant, chloride solvent, alkali mixtures, potassium tert-butanolate, |

hexachloromelamine, sulfur cichloride and strong reductant.

**Hazardous decomposition products:** Carbon monoxide and carbon dioxide from heat decomposition.

## 11. TOXICOLOGICAL INFORMATION

**Route of entry:** Skin contact, inhalation, ingestion, eye contact

**Symptom:** Headache, weakness, fatigue, nausea, a drunken feeling, vomiting, frailty, coma, skin defatting, dermatitis, loss of direction.

**Acute toxicology:**

Skin:

1. May cause minor irritation if direct contact is made.

Inhalation:

1. No acute effect with low concentration; minor nose and throat irritation with high concentration (approx. 1000 ppm).
2. May cause drowsiness, nausea, vomiting, a drunken feeling and dizziness with concentrations higher than 2000 ppm.
3. May cause unconsciousness and death with concentrations higher than 10000 ppm.

Ingestion:

1. Causes throat, gastrointestinal tract, and stomach irritation.
2. Ingestion symptoms of large volume are similar to that of inhalation (e.g. headache, weakness, fatigue, etc.).
3. Entering the lungs may cause fatal lung damage.

Eye:

1. Causes short-term and minor irritation with high concentration vapor (1000 ppm).
2. Its liquid can cause serious eye irritation.

LD50 (animal test, route of absorption): 5800 mg/kg (rat, swallowing)

LC50 (animal test, route of absorption): 50100 ppm/6H (rat, inhaling)

500mg/24H (rabbit, skin): Cause minor irritation.

20mg/24H (rabbit, eyes): Cause moderate irritation

**Chronic toxicology or long term toxicology:**

1. Long term or frequent contact will cause skin defatting and dermatitis (dry, irritation, flushing, and cracking).
2. Under 1000 ppm concentration, exposing 3 hours everyday for 7 ~ 15 years will cause irritation to the nose and throat, loss of direction, and impotence.
3. Exposing to acetone will increase liver toxicology from chloride solvent, e.g. 1,1-Dichloroethylene, 1,1,2-trichloroethane, carbon chloride, chloroform,

Trichloroethylene, ethylene dibromide, Bromodichloromethane.
31500ug/m3/24H(mammal animal, inhalation) will affect reproduction ability.

## 12. ECOLOGICAL INFORMATION

**Ecological toxicology:**

**LC50 (Fishes):** 8300-40000 mg/l/96H

**EC50 (Aquatic invertebrates):** 10 mg/1/48H (water flea)

**Biological concentration factor (BCF):** 0.69

**Persistency and degradability:**

1. Though acetone can be rapidly biodegraded under aerobic and anaerobic condition, it is toxic to microorganism with high concentration.
2. If it is released to the atmosphere, it will react with Hydroxyl radicals (half-life period: 22 days)
3. If it is released to water, it is expected to biodegrade.

**Half-life period (Air):** 279 ~ 2790 hours

**Half-life period (Water surface):** 24 ~ 168 hours

**Half-life period (Groundwater):** 48 ~ 336 hours

**Half-life period (Soil):** 24 ~ 168 hours

**Bio-accumulation:**

1. Will not accumulate. Most of the acetone will be discharged from breathing. A small amount of acetone will turn into carbon dioxide through oxidation that will be discharged by breathing and urine.

**Fluidity in soil:**

1. It will be released in soil and evaporate from the surface of soil through biodegradation.

**Other adverse effect:** -

## 13. DISPOSAL CONSIDERATIONS

**Disposing method:**

1. Dispose of according to relevant law and regulations.
2. For small volumes, burn out in an approved solvent furnace. For large volumes, burn it in an approved incinerator.
3. Before disposing of waste, keep it in a safe container.
4. Bury those substances absorbed with acetone in an approved landfill.

## 14. TRANSPORT INFORMATION

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| **UN Number:** 1090 |
| **UN transport name:** Acetone |
| **Transport hazard classification:** Flammable liquid Class 3 |
| **Package classification:** II |
| **Oceanic pollutants (Yes/No):** No |
| **Special transport method and precautions:** - |

## 15. REGULATORY INFORMATION

**Applicable regulations:**

1. Rules of Labor Safety and Health Facilities.
2. Rules of Designation and Identification for Dangerous Goods and Harmful Substances.
3. Toxic chemical substances control Act.
4. Standard For Allowable Concentrations of Harmful Substance in Air in Labor Working Environment.
5. Road Safety Rules.
6. Method and Facility Standards for Industrial Waste Storage, Clearance, and Disposal.

## 16. OTHER INFORMATION

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|---|---|---|
| **Bibliography** | 1. CHEMINFO databank, CCINFO CD, 2005-2<br>2. RTECS databank, TOMES PLUS CD, Vol.63, 2005<br>3. HSDB databank, TOMES PLUS CD, Vol. 63, 2005<br>4. ChemWatch Databank, 2004-4 | |
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| **Prepared by** | Title: Safety Specialist | |
| **Date of preparation/ Edition** | October 30, 2014 A.3 | |
| **Remarks** | The sign "-" in above information denotes No Data Available, and the sign "/" denotes Not Applicable for this substance. The footnote of "NS" indicated in BEIs stands for non-single indication, while the sign "Sc" means attention needs to be paid to the group susceptible to affection, the sign "Nq" means no recommended value, and the sign "Sq" means for quasi-quantitative value". | |