

Number: 25

### Section 1: Product and Company Identification

<b>Product Name:</b> N-Methyl-2-Pyrrolidone
<b>Other Name:</b> -
<b>Recommended Use and Restrictions on Use:</b>
<b>Manufacturer or Supplier Name :</b> Shiny Chemical Industrial co., Ltd. <b>Address:</b> No.5, Yeong Gong 1st Rd., Yeong An Dist., Kaohsiung City 82841, Taiwan, R.O.C. <b>Telephone:</b> +886-7-861-9171 ext.711~714
<b>Emergency Phone No:</b> +886-7-861-9171ext.711~714 <b>Fax:</b> +886-7-622-2620

### Section 2: Hazards Identification

**Hazard Material Category:** Flammable Liquids: Category NO.4, Acute Toxicity: (Oral/Inhalation/Skin) Category NO.5, Skin Corrosion/Irritation: Category NO.2, Serious Eye Damage/Eye Irritation: Category NO.2A, Toxic for reproduction NO.1

**Label Content:**



**Label Statements:** Warning, Health Hazards

**Signal Words:** Danger

**Hazard Statements:**

1. Combustible liquid
2. Harmful if swallowed
3. Causes skin irritation
4. Causes serious eye irritation
5. Suspected of damaging fertility or the unborn child

**Precautionary Statements:**

1. Keep containers in a well-ventilated place.
2. Avoid long-term exposure.
3. If have an accident or feel uncomfortable, seek for medical attention.

### Section 3: Composition/Information on Ingredients

#### Pure Material

<b>Chemical Name:</b> N-Methyl-2-Pyrrolidone
<b>Synonymous:</b> NMP, N-Methylpyrrolidone, N-Methylpyrrolidinone, 1-Methyl-2-Pyrrolidone, M-Pyrol.
<b>CAS NO.:</b> 872-50-4
<b>% By Weight:</b> 100%



#### Section 4: First Aid Measures

<b>The First Aid Measures for Different Exposure Routes:</b>
<b>Inhalation:</b> <ol style="list-style-type: none"><li>1. Remove contamination sources or move victims to fresh air.</li><li>2. If breathing stops, administer artificial respiration. If heartbeat stops, administer cardiopulmonary resuscitation (CPR).</li><li>3. Get medical attention immediately.</li></ol>
<b>Skin Contact:</b> <ol style="list-style-type: none"><li>1. Wash skin with soap and water at least 5 minutes..</li><li>2. After washing, if irritation persists get medical attention immediately.</li><li>3. Clean up clothing and shoes thoroughly before re-using.</li><li>4. Get medical attention immediately</li></ol>
<b>Eye Contact:</b> <ol style="list-style-type: none"><li>1. Immediately flush eyes with water at least 5 minutes, and always lift eyelids.</li><li>2. After flushing, if irritation persists get medical attention immediately.</li><li>3. Get medical attention immediately</li></ol>
<b>Ingestion:</b> <ol style="list-style-type: none"><li>1. Drink 2 cups of fresh water, press tongue-root to induce vomiting.</li><li>2. Don't give any die to a coma patient.</li><li>3. Get medical attention immediately.</li></ol>
<b>The Most Important Symptoms and Hazardous Effects:</b> Irritation. Skin degreases and chaps.
<b>The Protection of First- Aides:</b> Use appropriate personal protective equipment such as class C clothing to take first aid in a safety area.
<b>Notes to Physicians:</b> -

#### Section 5: Fire Fighting Measures

<b>Suitable Fire Extinguishing Media:</b> Water mist, carbon dioxide, chemical dry, alcohol foam.
<b>Specific Hazards May Be Encountered During Fire-Fighting:</b> <ol style="list-style-type: none"><li>1. Vapors and liquids are flammable. Vapors heavier than air will propagate to distant places. It may cause flash back when meeting fire sources.</li><li>2. It is decomposed to produce toxic gas at a high temperature. Containers may break and explode in a fire scene.</li></ol>
<b>Specific Fire-Fighting Method:</b> <ol style="list-style-type: none"><li>1. Evacuate and extinguish fire from safe distance or protected areas.</li><li>2. Place in windward areas to avoid dangerous vapor and poisonous decomposing materials.</li><li>3. Stop the leak first before extinguishing fire. Let it burn if leaks cannot be stopped and have on harm in surroundings. If extinguishing fire in advance without stopping leaks, vapors with the air will form explosive</li></ol>



- mixtures and ignite again.
4. Isolate unfired materials and protect personnel.
  5. Move containers away from the fire scene in safe condition.
  6. Cool exposed storage tanks or containers with water mist.
  7. It may be invalid to extinguish fire with water mist unless fire fighters have been trained for extinguishing various flammable liquids.
  8. If leaks have not ignited, spray water mist to disperse vapors and protect the personnel stop spill.
  9. Large fire of large-scale area, use auto-operated control shelf of water mist or auto-waved extinguishing water aims.
  10. Evacuate from a fire scene as possible and let the fire burn thoroughly.
  11. Keep away from storage tanks.
  12. When safety valves of storage tanks alarm or change color, evacuate immediately.
  13. Forbid personnel without special protective apparatus entering.

**Specific Equipment for The Protection of Firefighters:** Extinguishing staffs should wear air respirators, extinguishing clothing, protective gloves.

## Section 6: Accidental Release Measures

### Personal Precautions:

1. Restrain personnel close to the spill area before totally cleaning out.
2. Confirm the cleaning work be responsible by trained staffs.
3. Wear appropriate personal protective equipments.
4. Avoid contacting with eyes and skin. Wash contaminated areas with water.

### Environment Needing Attention:

1. Flush spilled liquids with plenty of water.
2. Ventilate this area.
3. Remove all sources of ignition.
4. Report to governmental safety and hygiene institutes and related units.

### Spill Cleanup Measure:

1. Do not touch spilled material.
2. Avoid leaks flushing to sewers or confined areas.
3. Try to stop or reduce leaks in safety condition.
4. Use soil, sand, not reacting with spill, or similar to stable and inflammable materials to block leaks.
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.
6. Spray water on spilled areas.
7. Large spill: Contact fire control, urgent handling units and suppliers to seek aid.



## Section 7: Handling and Storage Methods

### Handling:

1. Engineering controls should operate and make the best of personal protective equipments while handling; Staffs should receive the training for danger and safe application of this material.
2. Avoid contacting eyes and skin. After using, wash hands immediately.
3. Avoid breathing the steam, and use the appropriate respirator.
4. Keep containers away from ignition sources, eat and incompatible substances.
5. Keep containers sealed when not using.

### Storage:

1. Keep sidewalks and exports unimpeded.
2. 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.
3. Use storage containers made of compatible substances. Package carefully to avoid spray out.
4. Don't use air or inert gas to pressurize and transport liquids from containers.
5. Don't pour contaminated liquids back to original storage containers.
6. Containers should be labeled, confined and prevented from damage while not using.
7. Store in shady, cool, dry, and well-ventilated place that sunshine cannot directly illuminate, and keep away from heat, ignition sources, and incompatible substances.
8. The floor should be constructed with the impermeable materials to avoid absorbing from the floor.
9. Set slope, doorsill or dig grooves in an entrance to discharge spill to safe places.
10. Storage areas should be labeled clearly with no barriers. Permit assigned or trained personnel to enter.
11. Keep storage areas away from workspace, lifts, building, room exits, and main passages.
12. Have appropriate fire extinguisher and leak cleaning apparatus near storage areas.
13. Check containers regularly whether damage or leak.
14. Check all new containers whether appropriately labeled and no damage.
15. Store spill in containers made of compatible substances.
16. Recommend temperature at 30-120°F (~0-50°C).
17. Keep containers sealed. Avoid high-humidity environment.
18. Storage tanks should be underground tanks. Seal whole area on the bottom to avoid leak surrounded with liquid dikes, which can block the whole capacity.



## Section 8: Exposure Controls and Personal Protection

<b>Engineering Controls:</b>			
1. Local exhaust or general ventilation systems.			
2. Direct outside exhaust vents.			
3. Supply adequate fresh air to replenish the exhausted air.			
<b>Guideline Information</b>			
<b>TWA</b>	<b>TLV-STEL</b>	<b>CEILING</b>	<b>BEI</b>
-	309mg/m <sup>3</sup>	-	-
<b>Personal Protection Equipment:</b>			
<b>Respiratory Protection:</b>			
1. Over TLV/PEL or unknown: Portable positive-pressure type respiratory protective equipments, positive-pressure full and air-feed type respirator.			
2. Escape: Mask with organic vapor cartridges, portable escape-type respiratory protective equipments.			
<b>Hand Protection Description:</b> Leak-proof gloves of butyl rubber and rubber-like.			
<b>Eye/Face Protection:</b> 1. Chemical splash proof goggles. 2. Full-type masks.			
<b>Skin and Body Protection Description:</b> 1. Leak-proof protective equipments of butyl rubber and rubber-like. 2. Avoid contacting with solvents.			
<b>Hygiene Practices:</b>			
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 and flush contaminated areas.			

## Section 9: Physical and Chemical Properties

<b>Physical State/Appearance:</b> Colorless liquids	<b>Odor:</b> Mild amine smell.
<b>Odor Threshold:</b> -- (monitor), - (censor)	<b>Melting Point:</b> -23.6°C
<b>pH:</b> 7.7-8.0	<b>Boiling Point:</b> 202°C
<b>Flammability:</b> -	<b>Flash Point:</b> 86°C
<b>Decompose Temperature:</b> 346°C	<b>Test Method:</b> close cup
<b>Auto-ignition Temperature:</b> 270°C (518°F)	<b>Explosion limits:</b> 1.3%~9.5%
<b>Vapor Pressure:</b> 0.29 mmHg @20°C	<b>Vapor Density:</b> 3.40 (air=1)
<b>Density:</b> 1.027g/cm	<b>Solubility:</b> Completely soluble.
<b>Log Kow:</b> -0.54	<b>Evaporation Rate:</b> 0.06 (N-butyl acetate=1)



## Section 10: Stability and Reactivity

<b>Chemical Stability:</b> Stable under ordinary conditions.
<b>Possible Danger Reacts Under the Special State:</b> 1. Strong oxidants (such as nitrate, perchlorate, and peroxide), strong reducing agents: Increases fire and explosion risk. 2. Strong acids: Intense reaction.
<b>Conditions to Avoid:</b> Heat, sparks, and ignition sources.
<b>Materials to Avoid:</b> Strong oxidants and reducing agents.
<b>Hazardous Decomposition Products:</b> It will be decomposed and produce CO and NO <sub>x</sub> at high temperature.

## Section 11: Toxicological Information

<b>Exposure Route:</b> Skin, inhalation, ingestion, eye.
<b>Signs/Symptoms:</b> Irritation, nausea, vomiting.
<b>Acute Toxicity:</b> <b>Skin Contact:</b> Skin irritation. <b>Inhalation:</b> Upper respiratory tract irritation. <b>Ingestion:</b> 1. May cause intestinal pain and stomachache, aching convulsion, nausea, vomiting and diarrhea. 2. Large exposures t will lead to conscious loss and death. <b>Eyes Contact:</b> It may cause severe irritation when contacting with liquids directly. LD50: 4200 mg/kg (rat, oral). LC50: >400ppm/8H (rat, inhalation).
<b>Chronic Toxicity or Long term Effects on Humans:</b> 1. Skin: Long-term and frequent exposure may cause cry skin arid and cracks. 2. Ingestion: The person that contacts normally every day, it does not have special change that chemistry or cell make up in the blood and urine. Local effects, sensitivity, chronic toxicity or long-term toxicity, specific effects: No effects available. It has been classified by the IARC as Group 3: The agent (mixture or exposure circumstance) is not classifiable as to its carcinogenicity to humans.

## Section 12: Ecological Information

<b>Eco toxicity :</b> LC50 (fish): Blue gill's fish/Fathead Minnow @22°C: 832/1072 mg/L; Trout @12°C: 3048 mg/L. EC50 (aquatic invertebrate): Big water flea (24 hours): >1000 mg/L. BCF: -
<b>The Persistence and Degradability:</b> 1. The experimental results show NMP is decomposed slowly in the sewage to > 90% by the living beings. Theoretical Value of BOD is 1.07g



<p>oxygen/g NMP.</p> <p>2. When released into the air, it is expected to have a photo-degradation. Because of solubility, it may be eroded by the rainwater.</p> <p>Half-life (Air): -</p> <p>Half-life (Water surface): -</p> <p>Half-life (Groundwater): -</p> <p>Half-life (Soil): 2/15 days.</p>
<p><b>Bio- accumulative Potential:</b> Not accumulate in the body.</p>
<p><b>Mobility in soil:</b> When released into the soil, it is expected to be absorbed by the soil and decomposed by the living beings slowly.</p>
<p><b>Other Adverse Effects:</b> A small amount of exposure has no toxicity to aquatic organism.</p>

### Section 13: Disposal Considerations

<p><b>Methods of waste Disposal:</b></p> <ol style="list-style-type: none"> <li>1. Deliver waste liquids to a certified solvent incinerator.</li> <li>2. Deliver NMP waste water to a waste water processing station. Activated carbon absorption for waste water treatment is the best.</li> <li>3. If little flows into the sewer or drain, flush with a large amount of water.</li> <li>4. If large flux, report to the environmental protection unit.</li> </ol>
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### Section 14: Transport Information

<p><b>United Nations Number (UN No):</b> -</p>
<p><b>UN Proper Shipping Name:</b> -</p>
<p><b>Transport Hazard Classes:</b> -</p>
<p><b>Packaging Group:</b> -</p>
<p><b>Ocean Pollutants (Yes/No):</b> -</p>
<p><b>Specific Transport Measures and Precautionary Conditions:</b> -</p>

### Section 15: Regulatory Information

<p><b>Applicable regulation:</b></p> <ol style="list-style-type: none"> <li>1. Waste storage and disposal methods and facilities setup standard.</li> <li>2. General rules of hazardous materials and harmful substances.</li> <li>3. Road and Traffic Safety Rules.</li> </ol>
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### Section 16: Additional Information

<p><b>References</b></p>	<p>Toxic Substances Control Act (TSCA) inventory. California Proposition 65. Carcinogens &amp; Reproductive Toxicity (CRT). Workplace Hazardous Materials Information System (WHMIS). Canadian Domestic Substances List (DSL). Canadian Non- Domestic Substances List (NDSL). Japanese Existing and New Chemical Substances (ENCS) inventory.</p>
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安全資料表  
(Safety Data Sheet)



勝一化工股份有限公司  
SHINY CHEMICAL INDUSTRIAL CO., LTD.

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	Australian Inventory of Chemical Substances (AICS). European Inventory of Existing Chemical Substances (EINECS). EPCRA (SARA Title III Section 313) hazardous chemicals.
<b>SDS Author</b>	Shiny Chemical Industrial Co., Ltd.
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<b>SDS Revision Date</b>	2016/09/01
<b>Notes</b>	"-" indicates data is not available at present. "/" indicates such column is not applicable.

