1 Identification of the substance/mixture and of the company

- **Product identifier**
- **Trade name:** Remover PG
- **Product number:** G050200
- **Application of the substance / the preparation** Photoresist remover
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
  MicroChem Corp.
  90 Oak Street
  P.O. Box 426
  Newton, MA 02464-0002  USA
- **Information department:**
  Product Safety
  Email: productsafety@microchem.com
- **Emergency telephone number:**
  MicroChem Corp : 617-965-5511
  Chemtrec USA Emergency : 800-424-9300
  Chemtrec International Emergency : 703-527-3887

2 Hazards identification

- **Classification of the substance or mixture**
  - GHS08 Health hazard
  - Rep. 1B  H360  May damage fertility or the unborn child.
  - GHS07
  - Skin Irrit. 2  H315  Causes skin irritation.
  - Eye Irrit. 2A  H319  Causes serious eye irritation.
  - STOT SE 3  H335  May cause respiratory irritation.
  - H227  Combustible liquid.

- **Label elements**
  - GHS label elements The product is classified and labelled according to the Globally Harmonized System (GHS).
  - Hazard pictograms
  - GHS07  GHS08

- **Signal word** Danger

  - Hazard-determining components of labelling:
    - N-methyl-2-pyrrolidinone
  - Hazard statements
    - H227 Combustible liquid.
    - H315 Causes skin irritation.
    - H319 Causes serious eye irritation.
Trade name: Remover PG

H360 May damage fertility or the unborn child.
H335 May cause respiratory irritation.

**Precautionary statements**

- **P210** Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- **P261** Avoid breathing dust/fume/gas/mist/vapours/spray.
- **P280** Wear protective gloves/protective clothing/eye protection/face protection.
- **P201** Obtain special instructions before use.
- **P312** Call a POISON CENTER or doctor/physician if you feel unwell.
- **P308+P313** IF exposed or concerned: Get medical advice/attention.
- **P337+P313** If eye irritation persists: Get medical advice/attention.
- **P370+P378** In case of fire: Use for extinction: CO2, powder or water spray.
- **P403+P233** Store in a well-ventilated place. Keep container tightly closed.

**Classification system:**

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

**3 Composition/information on ingredients**

**Description:** Mixture of the substances listed below with nonhazardous additions.

**Dangerous components:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>872-50-4 N-methyl-2-pyrrolidinone</td>
<td>99.9-99.5%</td>
</tr>
<tr>
<td>Repr. 1B, H360; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335; H227</td>
<td></td>
</tr>
<tr>
<td>Proprietary Surfactant</td>
<td>0.1-1.0%</td>
</tr>
<tr>
<td>Skin Irrit. 2, H315; Eye Irrit. 2, H319</td>
<td></td>
</tr>
</tbody>
</table>

**SVHC**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>872-50-4 N-methyl-2-pyrrolidinone</td>
<td></td>
</tr>
</tbody>
</table>

**4 First aid measures**

**Description of first aid measures**

- **After inhalation:**
  Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
Safety Data Sheet
acc. to ISO/DIS 11014

Trade name: Remover PG

· After swallowing:
  Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep person at rest. Seek immediate medical attention.

· Information for doctor:
  · Most important symptoms and effects, both acute and delayed: No further relevant information available.
  · Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Firefighting measures

· Extinguishing media
  · Suitable extinguishing agents:
    CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  · Special hazards arising from the substance or mixture: No further relevant information available.

· Advice for firefighters
  · Protective equipment: Wear SCBA.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
  Keep away from ignition sources
  · Environmental precautions: Do not allow to enter sewers/surface or ground water.

· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Ensure adequate ventilation.
  Dispose contaminated material as waste according to Section 13.

· Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

7 Handling and storage

· Handling:
  · Precautions for safe handling:
    Ensure good ventilation/exhaust at the workplace.
    Open and handle container with care.
    Prevent formation of aerosols.
    Store in cool, dry place in tightly closed containers.
  · Information about protection against explosions and fires:
    Keep respirator available.
    Keep ignition sources away - Do not smoke.

· Conditions for safe storage, including any incompatibilities

· Storage:
  · Requirements to be met by storerooms and containers:
    Store in a cool location.
    Suitable material for receptacles and pipes: steel or stainless steel.
  · Information about storage in one common storage facility: Store away from oxidizing agents.
  · Further information about storage conditions:
    Keep container tightly sealed.
This product is hygroscopic.

- **Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Control parameters**

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
<th>Medium</th>
<th>Time</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>872-50-4 N-methyl-2-pyrrolidone</td>
<td>WEEL 10 ppm</td>
<td>Skin</td>
<td>end of shift</td>
<td>5-Hydroxy-N-methyl-2-pyrrolidone</td>
</tr>
</tbody>
</table>

- **Ingredients with biological limit values:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
<th>Medium</th>
<th>Time</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>872-50-4 N-methyl-2-pyrrolidone</td>
<td>BEI 100 mg/L</td>
<td>urine</td>
<td>end of shift</td>
<td>5-Hydroxy-N-methyl-2-pyrrolidone</td>
</tr>
</tbody>
</table>

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Exposure controls**

- **Personal protective equipment:**

- **General protective and hygienic measures:**
  - Keep away from food and beverages.
  - Immediately remove all soiled and contaminated clothing.
  - Wash hands before breaks and at the end of work.
  - Avoid contact with the eyes and skin.
  - Do not inhale gases / fumes / aerosols.
  - Pregnant women should strictly avoid inhalation or skin contact.

- **Respiratory equipment:**
  - In case of low exposure, use cartridge respirator.  In case of intensive or longer exposure, use SCBA.

- **Protection of hands:**

  - **Protective gloves**
    - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
    - Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
    - Contact glove manufacturer for break-through time.

  - **Material of gloves** Butyl rubber, BR

  - **Penetration time of glove material** Contact glove manufacturer for break-through time.

  - **Eye protection:**

  - **Tightly sealed goggles**

(Contd. on page 5)
9 Physical and chemical properties

- Information on basic physical and chemical properties
  - General Information
    - Appearance:
      - Form: Liquid
      - Color: Clear to light yellow
  - Odor:
    - Odour threshold: Not determined.
  - pH-value at 20 °C (68 °F):
    - L. basisch
  - Change in condition
    - Melting point/Melting range: Undetermined.
    - Boiling point/Boiling range: 202 °C (396 °F)
  - Flash point: 86 °C (187 °F)
  - Flammability (solid, gaseous): Not applicable.
  - Ignition temperature: 270 °C (518 °F)
  - Decomposition temperature: Not determined.
  - Auto igniting: Product is not selfigniting.
- Danger of explosion: Not determined.
- Explosion limits:
  - Lower: 1.3 Vol %
  - Upper: 9.5 Vol %
- Vapor pressure at 20 °C (68 °F): 0.39-0.43 hPa (0-0 mm Hg)
- Density at 25 °C (77 °F): 1.030 g/cm³ (8.595 lbs/gal)
  - Relative density: Not determined.
  - Vapour density: Not determined.
  - Evaporation rate: 0.03 (BuAc=1)
- Solubility in / Miscibility with Water: Fully miscible.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - Dynamic: Not determined.
  - Kinematic: Not determined.
- Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity
- Chemical stability: Stable under normal use conditions
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: Strong oxidizing agents
- Hazardous decomposition products:
  - Carbon monoxide and carbon dioxide
11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:
    - *N*-methyl-2-pyrrolidinone
      - Oral LD50: 3914 mg/kg (rat)
      - Dermal LD50: 8000 mg/kg (rabbit)
      - Inhalative LC50/4 h: >5.0 mg/l (rat)

- Primary irritant effect:
  - on the skin: Irritant to skin and mucous membranes.
  - on the eye: Irritating effect.
  - Sensitization: No sensitizing effects known.
  - Experience with humans: No further relevant information available.

- Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

- Carcinogenic categories

  - IARC (International Agency for Research on Cancer)
    - None of the ingredients are listed.
  - NTP (National Toxicology Program)
    - None of the ingredients are listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity:
    - *N*-methyl-2-pyrrolidinone
      - LC50/24 h: >1000 mg/l (daphnia magna)
      - LC50/96 h: >500 mg/l (Leuciscus idus)

- Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    - Water hazard class 1 (Self-assessment): slightly hazardous for water
    - Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
  - Other adverse effects: No further relevant information available.
13 Disposal considerations

- Waste treatment methods
  - Recommendation:
  Must not be disposed of as regular garbage/trash. Do not allow product to reach sewage system. Disposal must be made in accordance with Federal, State, and Local regulations.
- Uncleaned packagings:
  - Recommendation: Disposal must be made in accordance with Federal, State, and Local regulations.

14 Transport information

- UN-Number
  - DOT, ADR, ADN, IMDG, IATA: Void
- UN proper shipping name
  - DOT, ADR, ADN, IMDG, IATA: Void
- Transport hazard class(es)
  - DOT, ADR, ADN, IMDG, IATA
  - Class: Void
- Packing group
  - DOT, ADR, IMDG, IATA: Void
- Environmental hazards:
  - Marine pollutant: No
- Special precautions for user
  - Not applicable.
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
  - Not applicable.
- Transport/Additional information:
  - Not Regulated
- UN "Model Regulation": 
  - USA

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
  - Section 355 (extremely hazardous substances):
    - None of the ingredients are listed.
  - Section 313 (Specific toxic chemical listings):
    - 872-50-4 N-methyl-2-pyrrolidinone
  - TSCA (Toxic Substances Control Act):
    - All ingredients are listed or comply with TSCA regulations.
  - Proposition 65
  - Chemicals known to cause cancer:
    - None of the ingredients are listed.
  - Chemicals known to cause reproductive toxicity for females:
    - None of the ingredients are listed.
Trade name: Remover PG

- Chemicals known to cause reproductive toxicity for males:
  None of the ingredients are listed.

- Chemicals known to cause developmental toxicity:
  872-50-4 N-methyl-2-pyrrolidinone

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    None of the ingredients are listed.
  - TLV (Threshold Limit Value established by ACGIH)
    None of the ingredients are listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    None of the ingredients are listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients are listed.

- Massachusetts State Right To Know List
  872-50-4 N-methyl-2-pyrrolidinone

- New Jersey State Right To Know List
  872-50-4 N-methyl-2-pyrrolidinone

- Pennsylvania Hazardous Substances List
  872-50-4 N-methyl-2-pyrrolidinone

- California SCAQMD Rule 443.1 VOC's: 1026 g/l; vapor pressure 0.3 mm Hg 20C
- GHS label elements The product is classified and labelled according to the Globally Harmonized System (GHS).

- Hazard pictograms

  GHS07  GHS08

- Signal word Danger

- Hazard-determining components of labelling:
  N-methyl-2-pyrrolidinone

- Hazard statements
  H227 Combustible liquid.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H360 May damage fertility or the unborn child.
  H335 May cause respiratory irritation.

- Precautionary statements
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P201 Obtain special instructions before use.
  P312 Call a POISON CENTER or doctor/physician if you feel unwell.
  P308+P313 IF exposed or concerned: Get medical advice/attention.
  P337+P313 If eye irritation persists: Get medical advice/attention.
  P370+P378 In case of fire: Use for extinction: CO2, powder or water spray.
  P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Product safety department
- **Contact:** Mr. Weber
- **Last Revision Date:** 8/15/2013 Revised precautionary statements. Updated component toxicology data and US State Right to Know listings.
- **Abbreviations and acronyms:**
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  - ICAO: International Civil Aviation Organization
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - VOC: Volatile Organic Compounds (USA, EU)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent