1. Identification of preparation and company

   Product identification
   Negative Tone Photoresist ma-N 2403

   Identification of manufacturer/address
   micro resist technology GmbH
   Koepenicker Str. 325  Tel. +49 - 30 - 6576 2192
   D-12555 Berlin  Fax +49 - 30 - 6576 2193

2. Composition / Information on ingredients

   Photoactive compound and novolak dissolved in mixture of organic liquids.
   The product contains the following dangerous components:
   2.1. 1-Methyl-2-pyrrolidone
        CAS: 872-50-4  EINECS: 212-828-1  UN: -
   2.2. n-Butyl acetate
        CAS: 123-86-4  EINECS: 204-658-1  UN: 1123
   2.3. Cyclohexanone
        CAS: 108-94-1  EINECS: 203-631-1  UN: 1915

3. Hazards identification

   The handling of this product has to be carefully. Injury can be excluded if manipulation is mindful.
   The product is flammable.

4. First-Aid Measures

   After inhalation:
   Fresh air, if necessary breath donation, in case of unconsciousness: stable side position for transport.

   After skin contact:
   Wash off with plenty of water and soap.

   After eye contact:
   Rinse out with plenty of water, consult a doctor.

   If swallowed:
   Drink plenty of water, in case of persistent symptoms consult a doctor.

5. Fire fighting measures

   Suitable extinguishing media:
   Foam, CO2, Powder.

   Extinguishing media to be avoided:
   Water.

   Protective firefighting equipment:
   Self-contained breathing apparatus with full facepiece operated in positive pressure mode.

6. Accidental release measures

   Person-related safety precautions:
   Ensure well ventilation, do not inhale aerosols, remove ignition sources.

   Environmental protection measures:
   Prevent reaching drainage system, holes, cellars, ground or ground water. If needed alarm neighbourhood.

   Cleaning measures:
   Take up with liquid-binding material. Forward for disposal. Do not flush away with water.
   Pay attention to item 8 and 13.

7. Handling and storage

   Handling
   Ensure well ventilation/exhaustion at workplace.

   Storage
   Tightly closed in well-ventilated place. Protect from light. Store at room temperature. Keep away from sources of ignition and heat. Protect against electrostatic charges.
   Pay attention to regulation on inflammable liquids.
### 8. Exposure controls / personal protection

**Limit values at workplace**

<table>
<thead>
<tr>
<th>Exposure limits [ ml/m³ / mg/m³ ]</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19 / 80</td>
<td>1-Methyl-2-pyrrolidone</td>
<td></td>
</tr>
<tr>
<td>100 / 480</td>
<td>n-Butyl acetate</td>
<td></td>
</tr>
<tr>
<td>- / -</td>
<td>Cyclohexanone</td>
<td></td>
</tr>
</tbody>
</table>

**Personal protective equipment**

- Breathing protection: not required if room is well-ventilated
- Hand protection: required
- Eye protection: required
- Body protection: Protective work clothing
- Industrial hygiene: Don't drink, eat or smoke. Change contaminated clothing. Wash hands and face after working with substance.

### 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>liquide</td>
</tr>
<tr>
<td>Colour</td>
<td>red-brown</td>
</tr>
<tr>
<td>Odour</td>
<td>aromatic</td>
</tr>
<tr>
<td>Density (25 ºC)</td>
<td>1.028 g/cm³</td>
</tr>
<tr>
<td>Viscosity (25 ºC, D= 1000 s⁻¹)</td>
<td>10 mPas</td>
</tr>
<tr>
<td>Flash point</td>
<td>45.0 ºC</td>
</tr>
<tr>
<td>Solubility in Water (25 ºC)</td>
<td>insoluble</td>
</tr>
<tr>
<td>Boiling point</td>
<td>202 ºC 1-Methyl-2-pyrrolidone</td>
</tr>
<tr>
<td></td>
<td>127 ºC n-Butyl acetate</td>
</tr>
<tr>
<td></td>
<td>~156 ºC Cyclohexanone</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>1.33 hPa (40 ºC)</td>
</tr>
<tr>
<td></td>
<td>13 hPa (20 ºC)</td>
</tr>
<tr>
<td></td>
<td>4.0 hPa (20 ºC)</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>430 ºC 1-Methyl-2-pyrrolidone</td>
</tr>
<tr>
<td></td>
<td>370 ºC n-Butyl acetate</td>
</tr>
<tr>
<td></td>
<td>370 ºC Cyclohexanone</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>1.3 – 9.5 Vol-% 1-Methyl-2-pyrrolidone</td>
</tr>
<tr>
<td></td>
<td>1.2 - 7.5 Vol-% n-Butyl acetate</td>
</tr>
<tr>
<td></td>
<td>1.3 – 9.4 Vol-% Cyclohexanone</td>
</tr>
</tbody>
</table>

### 10. Stability and reactivity

**Conditions to avoid:**
- Sunlight, heating, ignition sources, electro-static charge

**Materials to avoid:**
- Oxidizing agents

**Hazardous decomposition products:**
- Not known

### 11. Toxicological information

**Acute toxicity:**

<table>
<thead>
<tr>
<th>LD50 (oral,rat)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methyl-2-pyrrolidone</td>
<td>3598 mg/kg</td>
</tr>
<tr>
<td></td>
<td>10768 mg/kg</td>
</tr>
<tr>
<td></td>
<td>1540 mg/kg</td>
</tr>
</tbody>
</table>

**Further toxicological information:**

- Poison class CH: 5 n-Butyl acetate
- 4 Cyclohexanone

### 12. Ecological information

Quantitative ecological data are not available. Avoid release to environment.

### 13. Disposal

**Product:**
- Disposal as halogen-free organic solvent.
- EAK-Key: 140503

**Packaging:**
- If contaminated like the substance itself.
- EAK-Key: 150199D1
- Not contaminated: Recycling/Household waste.
- Dispose in accordance with all applicable federal, state and local environmental regulations.
14. Transport information

**UN-No.**: 1866

- **Land transport**: Designation: Resin Solution
  - GGVE/GGVS: 3/31c
  - RID/ADR: 3/31c
  - Kemler number: 30
- **Maritime transport**: Designation: Resin Solution
  - Packaging group III
  - IMDG: 3.3/III
  - EMS: 3-07
  - MFAG: 330
- **Air transport**: Designation: Resin Solution
  - Packaging group III
  - IATA-DGR CAO: 3
  - Packaging instruction: 310
  - IATA-DGR PAX: 3
  - Packaging instruction: 309

15. Regulatory information

**Germany**:
- Pack-Kat.: A
- LGK: 3A
- WGK: 1
- VbF: All
- Hs-No.: 29142200 1-Methyl-2-pyrrolidone
  - 29153300 n-Butyl acetate
  - 29142200 Cyclohexanone

**EU Classification**:
- Danger symbol: Xi, Xn – irritant, harmful
- R-Phrases: 10-20-36/38-66-67 Flammable. Harmful by inhalation. Irritating to the eyes and skin. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.
- S-Phrases: 25-41 Avoid contact with eyes. In case of fire and/or explosion do not breath fumes.

16. Other information

- Replaces version of 06-Dec-00
- Reason of revision: Update of physical properties

All information in this paper is based on the present state of our knowledge but may vary in certain limits and does not have the meaning of a guarantee of any product features.