1 Identification of the substance/mixture and of the company

- **Product identifier**
  - **Trade name**: XP MicroSpray™ Positive Photoresist Spray
  - **Product number**: MSP0013
  - **Application of the substance / the preparation**: Photoresist

- **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 Composition/information on ingredients

- **Chemical characterization**: Mixtures
- **Description**: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>Chemical Characterization</th>
<th>Description</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>108-65-6 2-methoxy-1-methylethyl acetate</td>
<td>H226</td>
<td>55-80%</td>
</tr>
<tr>
<td>115-10-6 dimethyl ether</td>
<td>H220; H280</td>
<td>10-25%</td>
</tr>
<tr>
<td>1319-77-3 cresol (mix)</td>
<td>H301; H311; H314; H227</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

- **Additional Components**:
  - Mixed Cresol Novolac Resin 10-25%
  - Diazoo Photoactive Compound 5-10%

3 Hazards identification

- **Classification of the substance or mixture**
  - GHS02 Flame
  - H222 Extremely flammable aerosol.

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

- **Hazard pictograms**
  - GHS02

- **Signal word**: Danger

(Contd. on page 2)
Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 04/20/2012 Reviewed on 04/20/2012

Trade name: XP MicroSpray™ Positive Photoresist Spray

· **Hazard statements**
  H222 Extremely flammable aerosol.

· **Precautionary statements**
  P101 If medical advice is needed, have product container or label at hand.
  P102 Keep out of reach of children.
  P103 Read label before use.
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P251 Pressurized container: Do not pierce or burn, even after use.
  P211 Do not spray on an open flame or other ignition source.
  P410+P412 Protect from sunlight. Do no expose to temperatures exceeding 50 °C/122 °F.

· **Classification system:**
  · NFPA ratings (scale 0 - 4)
    Health = 2
    Fire = 4
    Reactivity = 2
  · HMIS-ratings (scale 0 - 4)
    HEALTH  Health = 2
    FIRE  Fire = 4
    REACTIVITY  Reactivity = 2

4 First aid measures

· **After inhalation:**
  Supply fresh air or oxygen; call for doctor.
  In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** Seek immediate medical advice.

5 Firefighting measures

· Suitable extinguishing agents: CO2, sand, extinguishing powder. Do not use water.
· For safety reasons unsuitable extinguishing agents: Water with full jet
· Special hazards arising from the substance or mixture No further relevant information available.
· 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:
  Ensure adequate ventilation.
  Do not flush with water or aqueous cleansing agents
· Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.

(Contd. on page 3)
7 Handling and storage

· Handling:
· Precautions for safe handling: Open and handle container with care.
· Information about protection against explosions and fires:
  Keep ignition sources away - Do not smoke.
  Protect against electrostatic charges.
  Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C, i.e. electric lights. Do not pierce or burn, even after use.
  Do not spray on a naked flame or any incandescent material.
· Storage:
· Requirements to be met by storerooms and containers:
  Store in a cool location.
  Observe official regulations on storing packagings with pressurized containers.
· Information about storage in one common storage facility: Not required.
· Further information about storage conditions:
  Keep container well-sealed in cool, dry location.
  Protect from heat and direct sunlight.
· 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.
· Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>WEEL</th>
<th>CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>108-65-6 2-methoxy-1-methylethyl acetate</td>
<td>50 ppm</td>
<td>5 ppm</td>
</tr>
<tr>
<td>115-10-6 dimethyl ether</td>
<td>1000 ppm</td>
<td></td>
</tr>
<tr>
<td>1319-77-3 cresol (mix)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL</th>
<th>REL</th>
<th>TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22 mg/m³</td>
<td>10 mg/m³</td>
<td>20* mg/m³</td>
</tr>
<tr>
<td>Skin</td>
<td></td>
<td>2.3 ppm</td>
<td></td>
</tr>
</tbody>
</table>

· Additional information: The lists that were valid during the creation were used as basis.
· Personal protective equipment:
· General protective and hygienic measures: Wash hands before breaks and at the end of work.
· Respiratory equipment: Use suitable respiratory protective device in case of insufficient ventilation.
· Protection of hands:
  Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.
· Material of gloves: Butyl rubber, BR
· Penetration time of glove material: Contact glove manufacture for break-through time.
9 Physical and chemical properties

- **Form:** Aerosol
- **Color:** Amber colored
- **Odor:** Characteristic
- **Odour threshold:** Not determined.
- **pH-value:** Not determined.
- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** -24°C (-11 °F)
- **Flash point:** -42°C (-44 °F)
- **Flammability (solid, gaseous):** Not applicable.
- **Ignition temperature:** 235°C (455 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not selfigniting.
- **Explosion limits:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
  - **Lower:** 1.5 Vol %
  - **Upper:** 18.6 Vol %
- **Vapor pressure at 20°C (68 °F):** 5200 hPa (3900 mm Hg)
- **Density:** Not determined.
- **Relative density:** Not determined.
- **Vapour density:** Not determined.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with Water:** Not miscible or difficult to mix.
- **Segregation coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - **Dynamic:** Not determined.
  - **Kinematic:** Not determined.
- **Solvent content:** 70-80 %
- **Other information** No further relevant information available.
10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:**
  - Nitrogen oxides
  - Irritant gases/vapors
  - Aldehyde
  - Carbon monoxide and carbon dioxide
- **Additional information:** May form peroxides

11 Toxicological information

- **Acute toxicity:**
  - **Primary irritant effect:**
    - on the skin: No irritant effect.
    - on the eye: No irritating effect.
    - **Sensitization:** No sensitizing effects known.

12 Ecological information

- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** 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.

13 Disposal considerations

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

14 Transport information

- **UN-Number**
  - DOT, ADR, IMDG, IATA: UN1950
- **UN proper shipping name**
  - DOT, IATA: AEROSOLS, flammable
  - ADR: 1950 AEROSOLS
  - IMDG: AEROSOLS
Trade name: XP MicroSpray™ Positive Photoresist Spray

<table>
<thead>
<tr>
<th>· Transport hazard class(es)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>· DOT</td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>2.1</td>
</tr>
<tr>
<td>· Label</td>
<td>2.1</td>
</tr>
<tr>
<td>· ADR</td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>2.5F Gases</td>
</tr>
<tr>
<td>· Label</td>
<td>2.1</td>
</tr>
<tr>
<td>· IMDG, IATA</td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>2.1</td>
</tr>
<tr>
<td>· Label</td>
<td>2.1</td>
</tr>
<tr>
<td>· Packing group</td>
<td>DOT, ADR, IMDG, IATA Void</td>
</tr>
<tr>
<td>· Environmental hazards:</td>
<td>No</td>
</tr>
<tr>
<td>· Marine pollutant:</td>
<td>No</td>
</tr>
<tr>
<td>· Special precautions for user</td>
<td>Warning: Gases</td>
</tr>
<tr>
<td>· Danger code (Kemler):</td>
<td>-</td>
</tr>
<tr>
<td>· EMS Number:</td>
<td>F-D,S-U</td>
</tr>
<tr>
<td>· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>· UN &quot;Model Regulation&quot;:</td>
<td>UN1950, AEROSOLS, 2.1</td>
</tr>
</tbody>
</table>

## 15 Regulatory information

### Sara

#### Section 355 (extremely hazardous substances):

None of the ingredients is listed.

#### Section 313 (Specific toxic chemical listings):

- 1319-77-3 cresol (mix)

### TSCA (Toxic Substances Control Act):

All ingredients are listed or comply with TSCA regulations.
Trade name: XP MicroSpray™ Positive Photoresist Spray

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

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    1319-77-3 cresol (mix) C
  - IARC (International Agency for Research on Cancer)
    None of the ingredients is listed.
  - NTP (National Toxicology Program)
    None of the ingredients is listed.
  - TLV (Threshold Limit Value established by ACGIH)
    None of the ingredients is listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    None of the ingredients is listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients is listed.

- GHS label elements
  The product is classified and labelled according to the Globally Harmonized System (GHS).

- Hazard pictograms
  GHS02

- Signal word
  Danger

- Hazard statements
  H222 Extremely flammable aerosol.

- Precautionary statements
  P101 If medical advice is needed, have product container or label at hand.
  P102 Keep out of reach of children.
  P103 Read label before use.
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P251 Pressurized container: Do not pierce or burn, even after use.
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  P410+P412 Protect from sunlight. Do no expose to temperatures exceeding 50 °C/122 °F.

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
**Trade name: XP MicroSpray™ Positive Photoresist Spray**

- **Contact:** Mr. Bedet

**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)