SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT USE: Organic Polymer Solution
TRADE NAME: MMA(17.5)MAA Copolymer Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section
SUPPLIER: MicroChem Corporation
90 Oak Street, PO Box 426
Newton, MA 02464-0002
TELEPHONE: (617) 965-5511
FAX: (617) 965-5818
CHEMTREC USA EMERGENCY #: (800) 424-9300
CHEMTREC INTL EMERGENCY #: (703) 527-3887
MSDS DATE: 06 November 2008
REVISION DATE: 18 December 2008

SECTION 2. HAZARDS IDENTIFICATION

Hazardous Classification
Acute toxicity (inhalation – gas/vapour) – Category 3
Acute toxicity (oral) – Category 4
Flammable liquids - Category 4
Serious eye damage/eye irritation - Category 2A
Skin corrosion/irritation - Category 3
Target organ systemic toxicant single exp - Category 3

Signal Word: DANGER!

Hazards
Combustible liquid.
Toxic if inhaled.
Causes serious eye irritation.
Causes mild skin irritation.
Harmful if swallowed.
May cause drowsiness and dizziness.
May cause respiratory irritation.

Precautions
Use only outdoors or in a well-ventilated area.
Keep away from flames and hot surfaces.
Do not breathe mist or vapors.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Wear protective gloves and eye/face protection.
If skin irritation occurs, get medical advice/attention. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Rinse mouth. Call a POISON CENTRE or doctor/physician if you feel unwell. Use extinguishing measures that are appropriate to local circumstances.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS: Ethyl Lactate (CAS:97-64-3); 86-98%; (See Table 1-Section 9) Poly(methylmethacrylate/methacrylic acid) (CAS: 25086-15-1); 2-14%

SECTION 4. FIRST AID MEASURES

INHALATION: If respiratory irritation or distress occurs remove victim to fresh air and seek medical attention. INGESTION: Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep at rest. Seek immediate medical attention. SKIN CONTACT: In case of contact, immediately wash with plenty of soap and water for at least 5 minutes. Seek medical attention. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use. EYE CONTACT: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek medical attention.

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, and foam. SPECIAL FIRE FIGHTING PRECAUTIONS: Wear self-contained breathing apparatus (SCBA) and personal protective equipment to prevent contact with skin and eyes. UNUSUAL FIRE OR EXPLOSION HAZARDS: Heat will build pressure and may rupture closed containers. Keep containers cool with water spray.

SECTION 6. ACCIDENTAL RELEASE MEASURES

EVACUATION PROCEDURES & SAFETY: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8. Eliminate all sources of ignition. Do not breathe vapors or dust. CLEANUP & DISPOSAL OF SPILL: Absorb with an inert absorbent. Sweep up and place in an appropriate closed container. Use clean, non-sparking tools to collect absorbed material.
PRODUCT USE: Organic Polymer Solution
TRADE NAME: MMA(17.5)MAA Copolymer Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section

ENVIRONMENTAL & REGULATORY REPORTING: Do not flush to drain. If required proper authorities should be notified.

SECTION 7. HANDLING AND STORAGE---------------------------------------------
PRECAUTIONS: Store locked up. Store container tightly closed in well-ventilated place.
STORAGE: Store in tightly closed container in a cool, dry, well-ventilated environment away from ignition source.
HANDLING: Use only under yellow light.
Keep away from heat, sparks, and flames.
Use only with mechanical exhaust.
Do not contact with skin, eyes, and clothing.
Avoid prolonged or repeated contact with skin.
Do not breathe vapors or mist.
Wash with soap and water after handling.
Have safety shower and eye wash available.
Store and transfer under a blanket of dry inert gas.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION-------------------------------

OCCUPATIONAL EXPOSURE LIMITS: Ethyl lactate: None Established
RESPIRATORY PROTECTION: Under normal conditions, use of air-purifying (half-mask/full-face) respirator with cartridges/canisters approved for use against organic vapors, dust, mists and fumes is recommended.
VENTILATION: General area dilution/exhaust ventilation.
SKIN PROTECTION: Chemical resistant gloves are recommended.
EYE PROTECTION: Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES-------------------------------------

APPEARANCE: Clear, colorless liquid
ODOR: Mild, pleasant
BOILING POINT: 153 ºC (308 ºF)
SPECIFIC GRAVITY: See Table 1 below
VAPOR PRESSURE: 2.7 mm @ 20 ºC (68 ºF)
VAPOR DENSITY: 4.1 (air=1)
H₂O SOLUBILITY: See Table 1 below
% VOLATILES: See Table 1 below
EVAPORATION RATE: <1 (BuAc=1)
FLASH POINT: 61 ºC (141 ºF) CC
EXPLOSION LIMITS: 1.5% lower
11.4% upper
AUTO IGNITION TEMP: 400 ºC (752 ºF)
SAFETY DATA SHEET

PRODUCT USE: Organic Polymer Solution
TRADE NAME: MMA(17.5)MAA Copolymer Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section

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Table 1

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<th>Name</th>
<th>Product#</th>
<th>Specific Gravity</th>
<th>Volatiles (% by wt.)</th>
<th>H2O Solubility (% by wt)</th>
<th>VOC (g/L)</th>
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SECTION 10. STABILITY AND REACTIVITY

STABILITY: Stable
INCOMPATIBILITY: Oxidizing Agents, Acids, Bases
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Carbon Monoxide, Carbon Dioxide

SECTION 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, ingestion, eye and skin contact

Symptoms of Exposure: Causes serious eye irritation. Causes mild skin irritation. May cause upper respiratory tract irritation, central nervous system depression, shortness of breath, drowsiness and confusion.

Acute Toxicity

Acute Oral Toxicity
Component: Ethyl lactate
LD50 rat >2000 mg/kg

Acute Dermal Toxicity
Component: Ethyl lactate
LD50 rabbit >5000 mg/kg

Acute Inhalation Toxicity
Component: Ethyl lactate
LC50 rat 5.4 mg/l
PRODUCT USE: Organic Polymer Solution
TRADE NAME: MMA(17.5)MAA Copolymer Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section

Specific Concentration Limits
The values listed below represent the percentages of ingredients of unknown toxicity:
14% Acute oral toxicity
14% Acute dermal toxicity
14% Acute inhalation toxicity

Skin corrosion/irritation
Component: Ethyl lactate
Acute Skin Irritation: Mildly irritating

Serious eye damage/eye irritation
Component: Ethyl lactate
Acute Eye Irritation: Causes serious eye irritation

Respiratory or Skin Sensitisation
Component: Ethyl lactate
Skin sensitization - Did not induce skin sensitization in guinea pigs.

Carcinogenicity
Component: Ethyl lactate
Studies in laboratory animals indicate that this substance is not carcinogenic.

Germ Cell Mutagenicity
Component: Ethyl lactate
No evidence of genotoxicity in standard bacterial and mammalian test systems in vitro.

Specific Target Organ Systemic Toxicity (single exposure)
Component: Ethyl lactate
Central Nervous system

Specific Target Organ Systemic Toxicity (repeated exposure)
Component: Ethyl lactate
Central Nervous System

Toxicity to Reproduction
Component: Ethyl lactate
No adverse effects to reproduction or adverse developmental effects known.

Aspiration Hazards
No data found.

SECTION 12. ECOLOGICAL INFORMATION

Acute aquatic toxicity

Acute toxicity to fish
Component: Ethyl lactate
No relevant studies identified
PRODUCT USE: Organic Polymer Solution
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Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section

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Acute toxicity to aquatic invertebrates
Component: Ethyl lactate
   48hr EC50 Daphnia magna: 683mg/L

Acute toxicity to algae
Component: Ethyl lactate
   No relevant studies identified

Specific concentration limits
The values listed below represent the percentages of ingredients of unknown toxicity.
0% Acute aquatic toxicity – fish
14 Acute aquatic toxicity – aquatic invertebrates
0% Acute aquatic toxicity - algae

Chronic aquatic toxicity
   Chronic toxicity to fish
      No data found
   Chronic toxicity to aquatic invertebrates
      No data found
   Chronic toxicity to algae
      No data found

Persistence/Degradability
Component: Ethyl Lactate
   Inherently biodegradable

Bioaccumulation
Component: Ethyl Lactate
   Not expected to bioaccumulate

Mobility
Component: Ethyl Lactate
   No data found

SECTION 13. DISPOSAL CONSIDERATIONS-----------------------------------------------

Precautions
CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied.
Dispose of contents/container in accordance with local regulation.

Disposal
Comply with applicable local, state or international regulations regarding the proper disposal of this material and/or containers.
SAFETY DATA SHEET

PRODUCT USE: Organic Polymer Solution
TRADE NAME: MMA(17.5)MAA Copolymer Series Resists
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section

SECTION 14. TRANSPORTATION INFORMATION

HAZARD CLASSIFICATION: Flammable Liquid
SHIPPING NAME: Resin Solution
UN NUMBER: UN 1866
PACKING GROUP III

SECTION 15. REGULATORY INFORMATION

US AND INTERNATIONAL INFORMATION

Chemical Inventories:
TSCA (US) – Components are listed or comply with TSCA regulations.
EINECS/ELINCS/NLP (EU) – Components are listed or exempt.
China – Components are listed.
Japan – Components are listed.
DSL/NDSL (Canada) – Components are listed.
AICS (Australia) – Components are listed.
Korea - Components are listed
Philippines – Components are listed.

SARA Title III: This product IS NOT subject to SARA Title III, Section 313 Reporting Requirements.

Calif. SCAQMD Rule 443.1 VOC's: See Table 1 – Section 9

SECTION 16. OTHER INFORMATION

National Fire Protection Association Hazard Ratings – NFPA:

2 Health Hazard Rating
2 Flammability Rating
0 Reactivity Rating

For additional information contact: productsafety@microchem.com

To the best of our knowledge, the above information is believed to be accurate but does not claim to be all-inclusive and is intended to be used only as a guide. The supplier makes no warranty of any kind, expressed or implied, concerning the use of this product and shall not be held liable for any damage resulting from handling or from contact with the above product. User assumes all risks incident to its use.

MSDS Revision Information: Revised GHS precaution phrases.