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MATERIAL SAFETY DATA SHEET

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SECTION 1. CHEMICAL IDENTIFICATION -----

CHEMICAL NAME: Organic Polymer Solution
TRADE NAME: 950PMMA Series Resists in Chlorobenzene
Positive Radiation Sensitive Resists
PRODUCT #: See Table 1 – Section 9

SECTION 2. COMPOSITION-----

HAZARDOUS
INGREDIENTS: Monochlorobenzene (CAS: 108-90-7); 85-99%
(See Table 1 – Section 9)
OTHER
INGREDIENTS: Poly(methylmethacrylate) (CAS: 9011-14-7)

SECTION 3. HAZARD DATA-----

INFLAMMABILITY: Flammable liquid.
SKIN CONTACT: Vapor and liquid can be extremely irritating to the skin.
EYE CONTACT: Vapor and liquid can be extremely irritating to the eyes.
INGESTION: Harmful or fatal if swallowed.
INHALATION: May cause respiratory tract irritation. Harmful or fatal if inhaled.
MUTAGENICITY: Not known to be mutagenic.
CARCINOGENICITY: Not known to be carcinogenic.
TARGET ORGANS: Skin, Liver, Kidneys, Respiratory System and Central Nervous System.

SECTION 4. FIRST AID MEASURES-----

INHALATION: If inhaled, remove to fresh air. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.
INGESTION: DO NOT induce vomiting. Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.
SKIN CONTACT: Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.
EYE CONTACT: Pour a gentle stream of warm water through the affected eye for at least 15 minutes. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

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SECTION 5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide.
SPECIAL FIRE FIGHTING PRECAUTIONS: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Remove all ignition sources if it can be done safely.
UNUSUAL FIRE OR EXPLOSION HAZARDS: Emits toxic fumes under fire conditions. Can decompose to toxic, corrosive hydrogen chloride and possible traces of phosgene. Heat will build pressure and may rupture closed containers. Keep containers cool with water spray. Vapor may travel a considerable distance to source of ignition and flash back.

SECTION 6. ACCIDENTAL RELEASE PROCEDURES

EVACUATION PROCEDURES & SAFETY: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
CLEANUP & DISPOSAL OF SPILL: Absorb with an inert absorbent. Sweep up and place in an appropriate closed container (see Section 7). Clean up residual material by washing area with water. Collect washings for disposal.
ENVIRONMENTAL & REGULATORY REPORTING: Do not flush to drain. If required proper authorities should be notified.

SECTION 7. STORAGE AND HANDLING PRECAUTIONS

STORAGE: Store in tightly closed container in a cool environment away from direct sunlight. Do not store in aluminum containers.
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. Severe eye irritant.
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.

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SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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 or local ventilation.

SKIN PROTECTION: Impervious (Viton®, PVA) gloves are highly recommended.

EYE PROTECTION: Safety goggles are highly recommended.

SECTION 9. PHYSICAL AND CHEMICAL DATA

APPEARANCE: Clear, colorless liquid
ODOR: Mild, mothball-like
BOILING POINT: 132 °C (270 °F)
SPECIFIC GRAVITY: See Table 1 below
VAPOR PRESSURE: 11.8 mm @ 20 °C (68 °F)
VAPOR DENSITY: 3.9 (air=1)
H₂O SOLUBILITY: 0.05% @ 30 °C, by wt.
% VOLATILES: See Table 1 below
EVAPORATION RATE: NA
FLASH POINT: 28 °C (82 °F) TCC
AUTOIGNITION TEMP: 638 °C (1180 °F)
EXPLOSION LIMITS: 1.3% lower
7.1% upper

Table 1

Name	Product #	Specific Gravity (g/ml)	Volatiles (% by wt.)	VOC (g/L)
950C1	M240001	1.106	99	1095
950C2	M240002	1.107	98	1085
950C3	M240003	1.108	97	1075
950C4	M240004	1.109	96	1065
950C4.5	M240504	1.109	95.5	1060
950C5	M240005	1.110	95	1055
950C6	M240006	1.111	94	1045
950C6.5	M240506	1.112	93.5	1040
950C7	M240007	1.113	93	1035
950C7.5	M240507	1.113	92.5	1030
950C8	M240008	1.114	92	1025
950C9	M240009	1.115	91	1015
950C10	M240010	1.115	90	1005
950C11	M240011	1.116	89	995
950C12	M240012	1.117	88	985
950C15	M240015	1.120	85	950

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SECTION 10. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY: Strong Oxidizing Agents, Strong Acids, Aluminum, Potassium, Sodium, Magnesium.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Carbon Monoxide, Carbon Dioxide, Hydrogen Chloride and possible traces of Phosgene.

SECTION 11. TOXICITY HAZARDS

As Chlorobenzene:

ACUTE EFFECTS:

Monochlorobenzene is a central nervous system depressant. Inhalation at concentrations in excess of the OSHA permissible exposure limit can cause headache, dizziness, eye, nose and throat irritation, nausea, feeling of drunkenness, unconsciousness and even death in confined or poorly ventilated areas. The available scientific literature indicates that severe inhalation overexposure may result in liver and kidney injury. May be absorbed through the skin. Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, including death.

ORAL:	LD50 (rat):	1580 mg/kg
INHALATION:	LC50 (rat):	22,000 ppm
ACGIH:	ACGIH (TWA)	10 ppm
OSHA:	OSHA (8hr TWA)	75 ppm

SECTION 12. ECOLOGICAL DATA

Ecotoxicological Information:

LC50 (96-hour, fathead minnow, flow-through):	16.9 mg/L
LC50 (48-hour, rainbow trout):	4.1 mg/L
LC50 (96-hour, bluegill):	16 mg/L

SECTION 13. DISPOSAL CONSIDERATIONS

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

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SECTION 14. TRANSPORTATION INFORMATION

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

SECTION 15. REGULATORY INFORMATION

EUROPEAN INFORMATION

EINECS LISTED

EC Nos: Monochlorobenzene 203-628-5

RISK & SAFETY PHRASES

R10 Flammable
R20 Harmful by inhalation.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S2 Keep out of the reach of children.
S24/25 Avoid contact with skin and eyes.
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

INDICATIONS OF DANGER

Xn Harmful
N Environmentally Dangerous

US AND INTERNATIONAL INFORMATION

HAZARDOUS LISTINGS: All ingredients appear on the TSCA Inventory of Chemical Substances, EINECS, Canadian DSL and the Japan ENCS Listing.
SARA Title III: This product IS subject to SARA Title III, Section 313 Reporting Requirements as chlorobenzene.
CERCLA Reportable Quantity: 100 lbs as chlorobenzene @ 88-99%
Calif. SCAQMD Rule 443.1 VOC's: See Table 1 – Section 9

SECTION 16. ADDITIONAL PRECAUTIONS AND COMMENTS

National Fire Protection Association Hazard Ratings – NFPA:

- 2 Health Hazard Rating
- 3 Flammability Rating
- 0 Reactivity Rating

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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:

- A) Removed “NANO” name from trade name.
- B) General update of MSDS. Added European Risk and Safety phrases to Section 15.