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## MATERIAL SAFETY DATA SHEET

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### SECTION 1. CHEMICAL IDENTIFICATION -----

CHEMICAL NAME: Organic Polymer Solution  
TRADE NAME: NANO™ 950 PMMA Series Resists in MIBK  
Positive Radiation Sensitive Resist  
PRODUCT #: See Table 1 - Section 9

### SECTION 2. COMPOSITION-----

HAZARDOUS  
INGREDIENTS: Methyl isobutyl ketone (CAS: 108-10-1); 95 - 98%.  
(4-methyl-2-pentanone)  
OTHER  
INGREDIENTS: Poly(methylmethacrylate) (CAS: 9011-14-7)

### SECTION 3. HAZARD DATA-----

INFLAMMABILITY: Flammable liquid.  
SKIN CONTACT: Irritation and Dermatitis on prolonged contact.  
EYE CONTACT: Causes moderate to severe irritation.  
MUTAGENICITY: Not known to be mutagenic.  
CARCINOGENICITY: Not known to be carcinogenic.  
TARGET ORGANS: Kidney and Liver

### SECTION 4. FIRST AID MEASURES-----

FIRST AID:  
INHALATION: Immediately remove to fresh air. If patient has stopped breathing, give artificial respiration. If breathing is difficult give oxygen. Contact physician immediately.  
INGESTION: DO NOT induce vomiting. Do not give anything to drink. Obtain medical assistance immediately. There is no specific antidote. Treatment should be directed at the control of symptoms and condition of the patient.  
SKIN CONTACT: Rinse with water for 15 minutes while removing contaminated clothing and shoes. Wash affected area with soap and water. Get medical attention if irritation persists.  
EYE CONTACT: Rinse immediately with water, flush for 15 min. Get emergency ophthalmological medical assistance immediately.

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**SECTION 5. FIRE FIGHTING MEASURES**-----

**EXTINGUISHING**

MEDIA: Dry chemical, carbon dioxide, 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. Vapor may travel a considerable distance to source of ignition and flash back.

**SECTION 6. ACCIDENTAL RELEASE PROCEDURES**-----

Eliminate all ignition sources.

Small spills may be flushed with large amounts of water. For large spills, wear self-contained breathing apparatus (SCBA), boots, and heavy gloves. Avoid eye or skin contact. Cover with dry absorbent material and collect in closed container for disposal using non-sparking tools. Transport container outside for disposal by approved methods. Rinse with water. All clean-up should be carried out in accordance with federal, state, and local regulations.

**SECTION 7. STORAGE AND HANDLING PRECAUTIONS**-----

STORAGE: Store in tightly closed container in a cool environment away from direct sunlight.

HANDLING: Keep away from heat, sparks, and flames.  
Avoid breathing vapors.  
Use only with adequate ventilation.  
Avoid contact with skin, eyes, and clothing.  
Wear impervious Butyl gloves.  
Wash with soap and water after handling.  
Have safety shower and eye wash available.

**SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**-----

**RESPIRATORY**

PROTECTION: In case of spills, use of self-contained breathing apparatus (SCBA) is recommended as narcosis may occur.

VENTILATION: Local or general mechanical ventilation is required.

SKIN PROTECTION: Impervious Butyl gloves are highly recommended.

EYE PROTECTION: Safety goggles are highly recommended.

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**SECTION 9. PHYSICAL AND CHEMICAL DATA**

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APPEARANCE: Clear, colorless liquid  
ODOR: Sharp, distinctive odor  
BOILING POINT: 116 °C (241 °F)  
SPECIFIC GRAVITY: See Table 1 below  
VAPOR PRESSURE: 15 mm @ 42 °C (108 °F)  
VAPOR DENSITY: 3.5 (air=1)  
H<sub>2</sub>O SOLUBILITY: 1.5% @ 20 °C, by wt.  
% VOLATILES: See Table 1 below  
EVAPORATION RATE: 1.6 (BuAc=1)  
FLASH POINT: 16 °C (61 °F) TCC  
EXPLOSION LIMITS: 1.2% lower  
8.0% upper

**Table 1**

Name	Product #	Specific Gravity (g/ml)	Volatiles (% by wt.)	VOC (g/L)
950M2	M280002	0.813	98	805
950M3	M280003	0.814	97	795
950M3.5	M280503	0.814	96.5	785
950M4	M280004	0.815	96	785
950M5	M280005	0.816	95	775

**SECTION 10. REACTIVITY DATA**

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STABILITY: Stable  
INCOMPATIBILITY: Strong Acids, Alkali's, Halogens  
HAZARDOUS POLYMERIZATION: Will not occur.  
HAZARDOUS COMBUSTION OR  
DECOMPOSITION PRODUCTS: Carbon Monoxide, Carbon Dioxide

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## SECTION 11. TOXICITY HAZARDS

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### ACUTE EFFECTS:

Harmful if swallowed or inhaled.

Can cause moderate to severe eye irritation. May cause irritation, stinging, redness, and swelling.

May cause irritation, itching, and redness of the skin. Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of the skin.

Exposure can cause headache, nausea, vomiting, dizziness, and drowsiness. Loss of consciousness may occur.

Inhalation causes irritation of the respiratory tract, nasal discomfort, chest pain, and coughing. Existing conditions such as asthma and fibrotic pulmonary disease may be aggravated.

Ingestion may cause irritation of the mouth, throat, and esophagus with nausea, abdominal discomfort, vomiting, diarrhea, dizziness, and drowsiness with possible liver and kidney damage.

As MIBK:

ORAL:	LD-50 (rat):	5.7 ml/kg
	LD-50 (rat):	1600-3200 mg/kg
INHALATION:	LC-50 (rat):	2000-4000 mg/kg

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## SECTION 12. ECOLOGICAL DATA

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Data for this material have been used to estimate its environmental impact. It has the following properties: a high biochemical oxygen demand and a potential to cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to persist in the environment, a low potential to bioconcentrate.

When diluted with a large amount of water, this material released directly or indirectly into the environment is not expected to have a significant impact.

### Oxygen Demand Data:

ThOD:	2.72 g oxygen/g
COD:	2.16-2.46 g oxygen/g
BOD-5:	1.94-2.06 g oxygen/g

### Acute Aquatic Effects Data:

24-h	EC-50 (daphid):	1550 mg/L
24-h	LC-50 (goldfish):	460mg/L
48-h	LC-50 (golden orfe):	672-744 mg/L
24-h	LC-50 (daphnid):	4280 mg/L

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

Used product is to be handled as a hazardous waste, U161 (toxic).  
Burn in an EPA-licensed chemical incinerator equipped with an afterburner and scrubber at an approved waste disposal facility.

**SECTION 14. TRANSPORTATION INFORMATION**-----

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

**SECTION 15. REGULATORY INFORMATION**-----

HAZARDOUS LISTINGS: All ingredients appear on the TSCA Inventory of Chemical Substances, EINECS, and the Japan Hazardous Chemical Listing.

SARA Title III: This product IS subject to SARA Title III, Section 313 Reporting Requirements.

CERCLA Reportable Quantity: 5,000 lbs as methyl isobutyl ketone @ 96%  
Calif. SCAQMD Rule 443.1 VOC's: See Table 1 - Section 9

**SECTION 16. ADDITIONAL PRECAUTIONS AND COMMENTS**-----

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.