FOR ANY EMERGENCY, CALL 24HOURS/7 DAYS: 1-800-654-6911

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC(R): 1-800-424-9300

FOR ALL MSDS QUESTIONS & REQUESTS, CALL: 1-800-511-MSDS

PRODUCT NAME: KTI PMMA STD 4% RES

I. PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 01-25-2001
SUPERCEDES: 03-22-1999

MSDS NO: 00941-0097 - 897505
SYNONYMS: None,

CHEMICAL FAMILY: Organic polymer and chlorinated hydrocarbon solvent

DESCRIPTION / USE: A solution of organic polymers in a chlorinated hydrocarbon employed in microlithography

FORMULA: Not applicable/Mixture

Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

II. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS or CHEMICAL NAME</th>
<th>CAS #</th>
<th>% Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene, chloro-</td>
<td>108-90-7</td>
<td>89 - 98</td>
</tr>
<tr>
<td>Polymethylmethacrylate</td>
<td>9011-14-7</td>
<td>2 - 11</td>
</tr>
</tbody>
</table>

III. HAZARDS IDENTIFICATION

OSHA Hazard Classification: flammable, eye irritant, skin irritant, respiratory irritant, central nervous system depressant, liver and kidney toxin,

Routes of Entry: Inhalation, skin, eyes, ingestion

Chemical Interactions: No known interactions

Medical Conditions Aggravated: Respiratory diseases including asthma and bronchitis, Pre-existing liver diseases, Pre-existing kidney disease,

Human Threshold Response Data

Odor Threshold:

Benzene, chloro- 0.68 ppm

Irritation Threshold: Not established

Hazardous Materials Identification Systems/National Fire Protection Association Classifications
### Hazard Ratings:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>2*</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>Not established</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Immediate (Acute) Health Effects

**Inhalation Toxicity:** Not expected to be toxic by inhalation. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.

**Inhalation Irritation:** High concentrations may be slightly irritating to the eyes, nose, throat, and lungs.

**Skin Contact:** Skin contact may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage.

**Eye Contact:** Contact may cause moderate irritation consisting of transient redness, swelling, and mucous membrane discharge to the conjunctiva. No corneal involvement or visual impairment is expected.

**Ingestion Irritation:** Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy or diarrhea.

**Ingestion Toxicity:** Not expected to be toxic by ingestion unless large amounts are swallowed.

**Acute Target Organ Toxicity:** Eyes, Skin, Respiratory Tract, Central nervous system.

### Prolonged (Chronic) Health Effects

**Carcinogenicity:** This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

**Reproductive and Developmental Toxicity:** No reproductive or developmental risk to humans is expected from exposure to this product.

**Inhalation:** Prolonged or repeated exposure will cause more severe irritation and possibly lung damage. Prolonged or repeated inhalation may cause kidney and liver damage.

**Skin Contact:** Dermal contact may cause defatting of skin and/or dermatitis.

**Ingestion:** Chronic (repeated) exposure may cause damage to the liver and kidneys.

**Chronic Target Organ Toxicity:** Lungs, Liver, Kidneys.

**Supplemental Health Hazard Information:** No additional health information available.

### IV. FIRST AID

**Inhalation:** IF INHALED: Remove individual to fresh air. If respiratory irritation develops, call a physician.

**Skin Contact:** IF ON SKIN: Flush skin with water for 15 minutes. Call a physician if irritation develops.

**Eyes:** IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids apart. Call a physician immediately.

**Ingestion:** IF SWALLOWED: Immediately drink water to dilute. Consult a physician if symptoms develop. Never give anything by mouth to an unconscious person.

### V. FIRE FIGHTING MEASURES

**Flammability Summary (OSHA):** Flammable.

**Flammable Properties:**

**Flash Point:** Approximately 29 Deg. C / Approximately 84 Deg. F (Test Method: Tag Closed Cup)

**Autoignition Temperature:** No data

**Upper Flammable/Explosive Limit, % in air:** Approximately 7.1 %

**Lower Flammable/Explosive Limit, % in air:** Approximately 1.3 %

**Fire/Explosion Hazards:** Vapors may be ignited by sparks, flames or other sources of ignition if material is above the flash point giving rise to a flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back.

**Extinguishing Media:** Use alcohol resistant foam, carbon dioxide, dry chemical, or vaporizing liquid extinguishing agents. Water spray or fog may also be effective for extinguishing or to absorb heat and keep exposed material from being damaged by fire.

**Fire Fighting Instructions:** In case of fire, use normal fire fighting equipment including a NIOSH approved self-contained breathing apparatus (SCBA). Use water to cool containers.

**Hazardous Combustion Products:** carbon dioxide, carbon monoxide, Phosgene, Hydrogen chloride.
Personal Protection for Emergency Situations:

Additional protective clothing must be worn to prevent personal contact with this material. These items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.

Spill Mitigation Procedures:

Air Release:
Hazardous concentrations in air may be found in local spill area and immediately downwind. Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Water Release:
This material is heavier than and slightly soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. If unable to divert create an overflow dam to contain material. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Land Release:
Create a dike or trench to contain materials. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Contain all contaminated water for disposal and/or treatment.

Additional Spill Information:
Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section XIII, Disposal Consideration.

VII. HANDLING AND STORAGE

Handling:
Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor. Ground and bond containers when transferring material.

Storage:
Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Store in a tightly closed container. Inside storage should be in a standard flammable liquids storage room or cabinet. Outside or detached storage is preferred.

Shelf Life Limitations:
See label or certificate of analysis for shelf life if applicable.

Incompatible Materials for Storage:
Refer to Section X, "Incompatible Materials."

VIII. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:
Local exhaust ventilation or other engineering controls are necessary when handling or using this product. Use explosion-proof ventilation equipment when handling this product.

Protective Equipment for Routine Use of Product

Respiratory Protection:
Wear a NIOSH approved respirator if levels above the exposure limits are possible.

Respirator Type(s):
A NIOSH approved air purifying respirator with organic vapor cartridge. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.

Skin:
Wear impervious gloves, boots and apron to avoid skin contact. A full impervious suit is recommended if exposure is possible to a large portion of the body.

Eyes:
Use chemical goggles.

Protective Clothing Type:
VitonTM,

Exposure Limit Data

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>OSHA PEL / STEL</th>
<th>ACGIH LIMITS</th>
<th>ACGIH WEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorobenzene</td>
<td>108-90-7</td>
<td>75 ppm TWA, 350 mg/m3 TWA</td>
<td>10 ppm TWA</td>
<td>Not Established</td>
</tr>
</tbody>
</table>

CHEMICAL NAME
NIOSH Immediately Dangerous to Life or Health:

Chlorobenzene

1000 ppm IDLH

IX. PHYSICAL DATA

Physical State:
clear viscous liquid

Color:
colorless

Odor:
mild Almond-like

Molecular Weight:
Not Applicable/Mixture

pH:
(@ 25 Degr. C) Not applicable
Octanol/Water Coeff: No data
Solubility in Water: Slight
Bulk Density: 1.1 g/cc
Specific Gravity: 1.1
Vapor Density: 3.9
Vapor Pressure: (@ 20 Deg. C) 9 mmHg
Evaporation Rate: 1.00 (n-Butyl acetate = 1)
Volatiles, % by vol.: 89 - 98 %
Boiling Point: No data
Freezing Point: No data

X. STABILITY AND REACTIVITY

Stability and Reactivity Summary: Stable under normal conditions. Static discharge may cause ignition at temperatures at or above the flash point.
Reactive Properties: Flammable, Not sensitive to mechanical shock. Product is sensitive to electrical static discharge.
Hazardous Polymerization: Will not occur
Conditions to Avoid: Temperatures above the flash point in combination with sparks, open flames, or other sources of ignition.
Chemical Incompatibility: strong oxidizing agents, strong reducing agents, acids, Bases
Hazardous Decomposition Products: carbon dioxide, carbon monoxide, phosgene, hydrogen chloride
Decomposition Temperature: No data

XI. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:
Benzene, chloro-- Oral LD50 Rat = 2.29 g/kg

Dermal LD50 value:
Benzene, chloro-- Dermal LD50 Rabbit > 2 g/kg

Inhalation LC50 value:
Benzene, chloro-- Inhalation LC50 (2h) Mouse = 4300 ppm

Product Animal Toxicity

Oral LD50 value:
Rat Believed to be 2 - 3 g/kg

Dermal LD50 value:
Rabbit Believed to be > 2 g/kg

Inhalation LC50 value: No data

Skin Irritation: This material is expected to be moderately irritating.
Eye Irritation: This material is expected to be moderately irritating.
Reproductive and Developmental Toxicity: This chemical is not known or reported to affect reproductive function or fetal development.

Component Data:
Benzene, chloro-- This chemical has been tested in laboratory animals and no evidence of teratogenicity, embryotoxicity or fetotoxicity was seen.
Mutagenicity: Not known or reported to be mutagenic.
Benzene, chloro-

This product has been tested for mutagenicity. Tests revealed both positive and negative results. Based on the weight of evidence, we judge this product NOT to be a mutagenic hazard.

Carcinogenicity:

This chemical was found to be carcinogenic only in male rats at high-dose levels. It was not carcinogenic in female rats or in male or female mice.

Component Data:

Benzene, chloro-

This chemical was found to be carcinogenic only in male rats at high-dose levels. It was not carcinogenic in female rats or in male or female mice.

XII. ECOLOGICAL INFORMATION

Ecological Toxicity Values:

Benzene, chloro-

Rainbow trout (Salmo gairdneri) 96 hr. LC50 = 7.46 mg/l (measured, flow-through).
Sheepshead minnow 96 hr. LC50 = 10 mg/l (nominal, static).
Bluegill 96 hr. LC50 = 7.4 mg/l (measured, flow-through).
Fathead minnow, 96 hr. LC50 = 16.9 mg/l (measured, flow-through).
Daphnia magna, 48 hr. LC50 = 13 mg/l (nominal, static).
Algae 96 hr. EC50 (growth) = 12.5 mg/l (nominal, static).

XIII. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary:

Spent or discarded material may be a hazardous waste.

Potential US EPA Waste Codes:

D001 D021

Disposal Methods:

As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

Components subject to land ban restrictions:

Chlorobenzene.

XIV. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT Description (49 CFR 172.101):

Land (U.S. DOT): CHLOROBENZENE SOLUTION 3 UN1134 PGII
Air (IATA/ICAO): CHLOROBENZENE SOLUTION, 3, UN1134, PGIII
Water (IMO): CHLOROBENZENE SOLUTION, 3, UN1134, PGIII
Flash Point: (C) 29

Hazard Label/Placard:

(Primary) FLAMMABLE

Chlorobenzene final RQ = 100 pounds (45.4 kg); also listed as Benzene, chloro-

Emergency Response Guide Number: 128

XV. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):

The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.

Pesticide acceptance indication: US EPA Registration Number: Not applicable

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311/312 (40 CFR 350.2):

Health: Acute
Chronic

Physical: Fire

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:

Not applicable.

Reportable Quantity (40 CFR 302.4):

Chlorobenzene

final RQ = 100 pounds (45.4 kg)

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components:

Chlorobenzene

form R reporting required for 1.0% de minimis concentration

Clean Air Act Socmi:

Chlorobenzene,

Clean Air Act Organic HAP 40 CFR Section 61.01(b)

Chlorobenzene,

Clean Air Act VOC Section 111

Chlorobenzene,

Clean Air Act Haz. Air Pollutants Section 112

Chlorobenzene,

State Right-to-Know Regulations Status of Ingredients:

Pennsylvania:

Benzene, chloro-

New Jersey:

Chlorobenzene

Massachusetts:

Chlorobenzene,

XVI. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revised to meet the ANSI standard of 16 sections.

MAJOR REFERENCES:


Other references available upon request.

THIS MATERIAL SAFETY DATA SHEET HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION THEREIN SHOULD BE PROVIDED TO ALL WHO WILL HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE USE OF PLANT ENGINEERING, OPERATIONS, AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT MAKES NO WARRANTY THAT IT IS CURRENT. ADDITIONALLY, IF THIS SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.