BREWER SCIENCE INC.
MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet has been prepared to comply with the EC Directive, Canadian WHMIS and the OSHA Hazard Communication Standard.

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SECTION 1: IDENTIFICATION

Product Name: PiRL III
Manufacturer: Brewer Science, Inc.
2401 Brewer Drive
Rolla, MO 65401
Information Phone Number: (573) 364-0300 Fax: (573) 368-3318
Emergency Phone Number: (800) 255-3924
MSDS Date of Preparation: 6/12/96

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SECTION 2: HAZARDOUS COMPONENTS

This product may contain any or all of the following hazardous chemicals and other proprietary materials not disclosed. The following hazard information is estimated as the physical and toxicological properties have not been fully evaluated. Handle with caution.

Component	CAS#	%	Exposure Limits
1-Methyl-2-Pyrrolidinone	872-50-4	70-95	None Established PEL/TLV 100 ppm (recommended)
Poly(amic Acid) resin	Proprietary	5 - 30	

This product contains a substance(s) that is subject to use restrictions under the Low Volume Exemption Provisions of the EPA Toxic Substance Control Act. This exemption restricts the use of this product to Microelectronics Manufacturing Applications. Contact Brewer Science, Inc. for additional information.

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SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is flammable. May cause eye, skin, and respiratory irritation. May cause headache, dizziness, nausea and other symptoms of central nervous system depression.

Potential Health Effects:

Eye: Contact with the liquid results in moderate eye irritation and may cause temporary corneal clouding.

Skin: Skin contact results in mild irritation. Prolonged skin contact may result in redness and dermatitis along with significant t absorption..

Inhalation: Inhalation of the vapors may result in respiratory irritation.

Ingestion: Accidental ingestion of the liquid causes gastric disturbances. Nausea and vomiting may result. This material may be a slight health hazard if ingested in large quantities.

Chronic Hazards: Repeated or prolonged exposure may cause reproductive disorders, bone marrow and lymphatic system.

Carcinogen Status: None of the components are listed as a carcinogen by OSHA, IARC, or NTP.

Medical Conditions Aggravated by Exposure: May cause stomach pains, vomiting, diarrhea.

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SECTION 4: FIRST AID MEASURES

Eye: Immediately rinse eyes with running water for 15 minutes. If irritation develops, get medical attention.

Skin: Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, get medical attention.

Inhalation: Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

Ingestion: If swallowed, dilute with water and immediately induce vomiting. Never dive fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

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SECTION 5: FIRE AND EXPLOSION DATA

Flash Point: 86 ˚C (187 °F)

Flammable Limits: LFL: 1.3 vol%
UFL: 9.5 vol%

Extinguishing Media: Use water fog, foam, CO2 or dry chemical extinguishing media.

Special Fire Fighting Procedures: Wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing. Cool fire exposed containers with water.

Unusual Fire Hazards: Low when exposed to heat or flames. It can react with oxidizing material.

Hazardous Decomposition Products: Oxides of carbon and unknown materials.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill: Remove all ignition sources such as open flames, spark producing equipment, pilot lights, etc. Wear appropriate protective clothing to prevent eye and skin contact including impervious gloves, safety goggles and respirator if needed. Ventilate area. Cover with and inert absorbent material and collect into an appropriate container for disposal. Report spills and releases as required to appropriate authorities.

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SECTION 7: HANDLING AND STORAGE

Handling: Avoid breathing vapors, aerosols and mists. Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Always wear impervious gloves, chemical safety goggles and protective clothing when handling this material. Wash thoroughly after handling. Do not eat, drink or smoke in the work area. Keep product away from heat, sparks, flames and all other sources of ignition. No smoking in storage or use areas. Keep containers closed when not in use.

Storage: Store in a cool, dry, well-ventilated location away from incompatible materials. Keep containers closed when not in use.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits.

Respiratory Protection: Wear an appropriate NIOSH/MSHA approved respirator. A self-contained or atmosphere supplying respirator is recommended. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.

Skin Protection: Impervious gloves are required.

Eye Protection: Chemical safety goggles or face shield required.

Other Protective Equipment: Impervious clothing is required to prevent skin contact and contamination of personal clothing. An eye wash facility and safety shower should be available in the work area.

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear, Colorless liquid. Objectable @ 100 ppm or higher.

pH: Not applicable
Boiling Point: 202 ˚C (395.6 °F)
Vapor Pressure: 0.29 mm Hg @ 20 ˚C
Vapor Density: 3.4

Specific Gravity: 1.026
Melting Point: Not applicable
Water Solubility: Not available
Evaporation Rate: Not available

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SECTION 10: STABILITY AND REACTIVITY

Stability: Stable: X Unstable:

Incompatibility/Conditions to Avoid: Strong oxidizing agents, strong acids, strong alkalis, and reducing agents. Keep away from heat, sparks, flames, and other sources of ignition.

Hazardous Decomposition Products: Oxides of carbon and unknown materials.

Hazardous Polymerization: May Occur: Will not occur: X

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SECTION 11: TOXICOLOGICAL INFORMATION

Acute Effects: Harmful if swallowed, inhaled, or absorbed through skin. Vapor or mist is irritating to the eyes, mucous membranes and upper respiratory tract.

Chronic Effects: Overexposure may cause reproductive disorders based on tests with laboratory animals.

n-Methyl-2-pyrrolidone:

Rate, Oral LD_{50}: 1400 mg/kg
Rabbit, Skin LD_{50}: 8 mg/kg

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SECTION 12: ECOLOGICAL INFORMATION

No ecotoxicity data is available for this product at this time.

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SECTION 13: DISPOSAL INFORMATION

Dispose in accordance with all local, state and federal regulations.

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SECTION 14: TRANSPORT INFORMATION

DOT Shipping Name: N/A
DOT Hazard Class: N/A
UN Number: N/A
DOT Labels Required (49CFR172.101): N/A
Hazardous Substance (49CFR172.101: N/A
Reportable Quantity: Product - Exempted

IATA Shipping Name: Not Required
IATA Hazard Class: N/A
UN Number: N/A
IATA Hazard Labels Required: None

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SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: Not available.

SARA TITLE III:
Hazard Category for Section 313: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Section 313 and 40CFR372of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

None

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements:

None

Section 302 Extremely Hazardous Substances (TPQ):

None

EPA Toxic Substances Control Act (TSCA) Status:

The ingredients of this product are on the TSCA inventory.

STATE REGULATIONS:

California Proposition 65:

None.

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SECTION 16: OTHER INFORMATION

NFPA Ratings:

Health	2
Flammability	2
Reactivity	0

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This above information is believed to be correct but does not propose to be all inclusive and shall be used only as a guide. Brewer Science shall not be held liable for any damage resulting from handling or from contact with the above product.