

**BREWER SCIENCE INC.
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.

**SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION
AND THE COMPANY/UNDERTAKING**

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:
Chemtrec Domestic North America: 800-424-9300
Chemtrec International: 703-527-3887

MSDS Date of Preparation: 7/25/02

MSDS Date of Revision: 08/04/06

Product Use: Polyimide for Lift-off Applications

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS# / EINECS#	%	EU Classification (67/548/EEC)
n-Methyl-2-pyrrolidone (NMP)	872-50-4 / 212-828-1	70-80	Xi R36/38
Polymer	Proprietary	20-30	Not applicable

See Section 16 for further information on EU Classification.

SECTION 3: HAZARDS IDENTIFICATION

Clear liquid with a fishy odor.

EMERGENCY OVERVIEW: Combustible liquid and vapor. Causes eye, skin, and respiratory irritation.

EU Preparation Classification (1999/45/EC): Irritant (Xi) R36/38

SECTION 4: FIRST AID MEASURES

Eye: Rinse thoroughly with water for at least 15 minutes, holding the eye lids open to be sure the material is washed out. Get immediate medical attention.

Skin: Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation or symptoms of exposure develop. Launder clothing before re-use.

Inhalation: Remove victim to fresh air. Give artificial respiration if needed. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Keep the victim calm and warm. Get immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Flash Point: 93°C (199°F)

Flammable Limits: LEL: 0.99 vol %
UEL: 3.9 vol %

Extinguishing Media: Use water fog or spray, foam, carbon dioxide or dry chemical.

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Issue/Revision Date	F.7.6.1133.D / 8/04/06

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: At temperatures above the flash point, explosive vapor-air mixtures may be formed.

Hazardous Decomposition Products: Oxides of carbon and nitrogen and unknown materials.

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.

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.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	Exposure Limits
n-Methyl-2-pyrrolidone	None Established (PEL/TLV) 10 ppm skin (AIHA WEEL)
Polymer	None Established (PEL/TLV)

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

Respiratory Protection: If needed, a NIOSH/MSHA approved respirator with organic vapor cartridges may be used. For higher exposures (greater than 10 times the TLV), a supplied air respirator may be required. 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 recommended. Based on available test data, butyl rubber gloves are suggested.

Eye Protection: Chemical safety goggles recommended.

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

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear liquid with a fishy odor.

pH: Not available

Boiling Point: 202°C

Vapor Pressure: 0.5 mmHg @ 25°C

Vapor Density: 3.4

Specific Gravity: Not available

Melting Point: Not Applicable

Water Solubility: Partially Soluble

Evaporation Rate: Not available

SECTION 10: STABILITY AND REACTIVITY

Stability: **Stable:** X **Unstable:**

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

Hazardous Decomposition Products: Combustion will produce oxides of carbon and nitrogen and unknown materials.

Hazardous Polymerization: May Occur: Will not occur: X

SECTION 11: TOXICOLOGICAL INFORMATION

Potential Health Effects:

Eye: May cause moderate irritation with pain, redness and blurred vision.

Skin: May cause redness, irritation, swelling, cracking and dryness. N-methyl-2-pyrrolidone may be absorbed through the skin causing effects similar to those described under inhalation.

Inhalation: Inhalation of vapors, mists or aerosols may cause mucous membrane and respiratory irritation and abdominal pain.

Ingestion: Swallowing may cause gastrointestinal irritation, abdominal pain, nausea, vomiting and diarrhea.

Chronic Hazards: Human experience has demonstrated severe dermatitis from prolonged/repeated skin exposure to n-methyl-2-pyrrolidone. N-methyl-2-pyrrolidone has been reported to cause adverse reproductive effects in laboratory animals.

Carcinogen Status: None of the components of this product are listed as carcinogens by OSHA, IARC or NTP.

Medical Conditions Aggravated by Exposure: Pre-existing skin diseases.

Acute Toxicity Values:

n-Methyl-2-pyrrolidone: Oral rat LD50 - 3914 mg/kg
Skin rabbit LD50 - 8 gm/kg

Polymer: No toxicity data is available

SECTION 12: ECOLOGICAL INFORMATION

This product has not been tested as a whole. The following ecotoxicity data is available for the components:
n-Methyl-2-pyrrolidone: LC50/96 hour values for fish are greater than 100 mg/L.

SECTION 13: DISPOSAL INFORMATION

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

SECTION 14: TRANSPORT INFORMATION

DOT Shipping Name: Combustible Liquid, n.o.s. (Excepted from HazMat in Non-Bulk Packaging) ERG #128

DOT Hazard Class: Combustible Liquid

UN Number: NA1993

DOT Labels Required (49CFR172.101): None

Hazardous Substance (49CFR172.101): None

Reportable Quantity: N/A

IATA Shipping Name: Not Regulated

IATA Hazard Class: None

UN Number: N/A

IATA Hazard Labels Required: None

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: Not applicable

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SARA TITLE III:

Hazard Category for Section 311/312: Acute Health, Chronic Health, Fire Hazard

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: n-Methyl-2-pyrrolidone CAS#872-50-4 70-80%

Section 302 Extremely Hazardous Substances (TPQ): None


EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

STATE REGULATIONS:

California Proposition 65: This product contains the following substances known to the State of California to cause developmental toxicity (birth defects): n-Methyl-2-pyrrolidone.

INTERNATIONAL REGULATIONS:

European Community Labeling :

	R36/38 Irritating to eyes and skin. S24/25 Avoid contact with skin and eyes. S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S60 This material and its container must be disposed of as hazardous waste.
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SECTION 16: OTHER INFORMATION

HMIS Ratings: Health - 2 Flammability - 2 Reactivity - 0
NFPA Ratings: Health - 2 Flammability - 2 Reactivity - 0

MSDS Revision History:

07/25/02: Changed to EU Format
03/18/04: Updated Section 1
08/04/06: Changed Emergency Telephone Numbers

EU Classes and Risk Phrases for Reference (See Sections 2 and 3):

Xi Irritant
R36/38 Irritating to eyes and skin.

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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.

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