MATERIAL SAFETY DATA SHEET

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1. PRODUCT IDENTIFICATION

TRADE NAME – UROCEL 100, B COMPONENT **CAS#** - MIXTURE
CHEMICAL NAME - 1,6-HEXAMETHYLENE DI ISOCYANATE BASED POLYISOCYANATE
CHEMICAL FAMILY- ALIPHATIC POLYISOCYANATE DOT CLASS – 6.1
FORMULA - NA
OSHA HAZARD COMMUNICATION
STATUS..... THIS PRODUCT IS HAZARDOUS UNDER CRITERIA OF THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

EMERGENCY CONTACT – ROBERT FORLONG DAY PHONE – (813) 248-3328

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2. HAZARDOUS INGREDIENTS

COMPONENTS:	%:	OSHA-PEL	ACGIH-TLV
HOMOPOLYMER OF HDI (CAS# 28182-81-2)	100	NE	NE
HEXAMETHYLENE DIISOCYANATE HDI (CAS# 822-06-0)	*	NE	.005 ppm TWA

*Monomer content is less than 0.2% based on resin solids at the time of manufacture.

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3. HAZARDS IDENTIFICATION:

EMERGENCY OVERVIEW

WARNING! Color: Clear/Pale Yellow; Form: Liquid; Odor: Negligible; May cause lung damage; May cause eye, skin, and respiratory tract irritation; May cause allergic respiratory reaction; Harmful if inhaled; May cause allergic skin reaction; Closed container may explode under extreme heat or when contaminated with water; Toxic gases/fumes are given off during burning or thermal decomposition.

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Inhalation; Skin Contact; Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF EVEREXPOSURE:
ACUTE INHALATION.....:HDI vapors or mist at concentrations above the TLV or MGL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction.). Persons with preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or MGL with similar symptoms as well as an asthma attack. Exposure well above the TLV or MGL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid

in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills) has also been reported.
CHRONIC INHALATION.....: As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the TLV or MGL. These symptoms, which include: chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized and individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including decreased in lung function, which may be permanent. Sensitization may be either temporary or permanent.
ACUTE SKIN CONTACT.....: Issocyanates react with skin protein and moisture and can cause irritation. Symptoms of skin irritation may be reddening, swelling, rash, scaling or blistering. Some persons may develop skin sensitization from skin contact. Cured material is difficult to remove.
CHRONIC SKIN CONTACT.....: Prolonged contact with the isocyanate can cause reddening, swelling, rash, scaling or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material or even as a result of vapor only contact.
ACUTE EYE CONTACT.....: Liquid, aerosols and vapors of this product are irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes.
CHRONIC EYE CONTACT.....: May result in corneal opacity (clouding of the eye surface).
ACUTE INGESTION.....: Can result in irritation and possible corrosive action in the mouth, stomach tissue and digestive tract.
CHRONIC INGESTION.....: None found

CARCINOGENICITY
NTP.....: Not listed
IARC.....: Not Listed
OSHA.....: Not listed

MEDICAL CONDITIONS
AGGRAVATED BY EXPOSURE.....: Asthma and other respiratory disorders (bronchitis, emphysema, hyperreactivity), skin allergies, eczema.
EXPOSURE LIMITS.....: Not established for product as a whole. Refer to Section II for exposure limits of hazardous constituents. The Manufacturer Guidline Level of 0.5 mg/m3 – TWA and 1.0mg/m3 – STEL for the Homopolymer of HDI monomer are internal guides based on limited data; they are provided as guides pending the review of future data.

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4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: Flush with clean, lukewarm water (low pressure) for at least 15 minutes, while lifting eyelids. Refer individual to physician or ophthalmologist for immediate follow-up.
FIRST AID FOR SKIN.....: Remove contaminated clothing immediately. Wash affected areas thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists.
FIRST AID FOR INHALATION.....: Move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. Consult physician.
FIRST AID FOR INGESTION....: Give 1 or 2 cups of milk or water to drink. DO NOT GIVE ANYTHING BY MOUTH TO UNCONSCIOUS OR CONVULSING PERSON. Consult physician.

NOTE TO PHYSICIAN.....: Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation frequently. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This product is a known sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Trat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the product. Inhalation: This product is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material must be removed from any further exposure to isocyanate.

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5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Greater than 200°F (93°C)
EXTINGUISHING MEDIA.....: Dry Chemical; Carbon Dioxide; Foam; Water spray for large fires.

SPECIAL FIRE FIGHTING PROCEDURES: Full emergency equipment with self contained breathing apparatus and full protective clothing should be worn by firefighters. During a fire, HDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion (See Section 10) Closed container may explode when exposed to extreme heat or burst when contaminated with water (CO2 evolved).

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6. ACCIDENTIAL RELEASE MEASURES:

SPILL OR LEAK PRECEDURES.....: Remove all sources of ignition and ventilate area. Notify appropriate authorities if necessary. Put on personal protective equipment (See Section VII). Dike or impound spilled material and control further spillage if feasible. Vermiculite, Fuller's earth or other absorbent material. Pour decontamination solution over spill area and allow to react for at least 10 minutes. Collect material in open containers and add further amounts if decontamination solution. Remove containers to a safe place, cover loosely, and allow to stand for 24 to 48 hours. Wash down spill area with decontamination solutions. Decontamination solutions: nonionic surfactant Union Carbide's Tergitol TMN-10 (20%) and water (80%); concentrated ammonia (3-8%), detergent (2%) and water (90-95%).

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7. HANDLING AND STORAGE::

STORAGE TEMPERATURE (MIN/MAX); -30°F-122°F
SHELF LIFE: 6 months at 77°F after receipt of material by customer.
SPECIAL SENSITIVITY.....: If container is exposed to high heat, it can be pressurized and possibly rupture explosively. HDU reacts slowly with water to form CO2 gas. This can cause sealed containers to expand and possibly rupture.
HANDLING/STORAGE PRECAUTIONS: Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. At maximum storage temperatures noted, material may slowly polymerize without hazard. Ideal storage temperature range for ease of handling is 50-81 F. Avoid contact with skin and eyes. Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard.

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8. PERSONAL PROTECTION:

REQUIRED WORK/HYGENE PROCEDURES.....: Precautions must be taken so that persons handling this product do not allow contact with the eyes or skin. In spray operations, protection must be afforded against exposure to both vapor and spray mist.
SKIN PROTECTION REQUIREMENTS.....: Permeation resistant gloves. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area protected only by the cream to a minimum.
VENTILATION REQUIREMENTS.....: Good industrial hygiene practice dictates that worker protection should be achieved through engineering controls such as ventilation whenever feasible. When such controls are not feasible to achieve full protection, the use of respirators and other personal protective equipment is mandated. (SEE RESPIRATOR REQUIREMENTS) Exhaust air may need to bb cleaned by scrubbers or filters to reduce environmental contamination. Curing ovens must be ventilated to prevent emissions into the workplace. If oven off-gases are not vented properly (i.e. they are released into the work area), it is possible to be exposed to airborne monomeric HDI.
RESPIRATOR REQUIREMENTS.....: A respirator that is recommended or approved for use in isocyanate containing environments (air purifying or fresh air supplied) may be necessary for spray applications or other situations such as high temperature use which may produce inhalation exposures. A supplied air respirator (either positive pressure or continuous flow type) is recommended. Before an air-purifying respirator can be used, air monitoring must be performed to measure airborne concentrations of HDI monomer, HDI polyisocyanate. See outline below for the specific conditions under which air-purifying respirators can be used. Observe OSHA regulations for respirator use (29 CFR 1910.134).
NON-SPRAY OPERATIONS:

A. During non-spray operations such as mixing, batch making, brush or roller application, etc., at elevated temperatures (for example, heating of material or application to a hot substrate), it is possible to be exposed to airborne isocyanate vapors. During non-spray operations using a solvent free coating system, a supplied air (either positive pressure or continuous flow type) respirator is mandatory when one or more of the following conditions exists:

B. –the airborne isocyanate concentrations exceed the TLV of 0.005 ppm; or

C. – the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed the MGL of 0.5 mg/m3 averaged over 8 hours, or 1.0 mg/m3 averaged over 15 minutes, or

D. – operations are performed in a confined space (See OSHA Confined Space Standard 49 CFR 1910.146).

MONITORING.....: Refer to Patty's Industrial Hygiene and Toxicology-Volume 1 (3rd. Edition) Chapter 17 and Volume III (1st edition) Chapter 3-for guidance concerning appropriate air sampling strategy to determine airborne concentrations of isocyanates.

MEDICAL SURVEILLANCE.....: Medical supervision of all employees who handle or come in contact with this product is recommended. This should include preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum). Persons with asthma-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

ADDITIONAL PROTECTIVE MEASURES.....: Safety showers and eyewash stations should be available. Educate and train employees in safe use of this product. Follow all label instructions.

- We recommend using the Geometric Mean Air Odor Threshold found in Table 5.1 of the "Odor Thresholds for Chemicals with Established Occupational Health Standards," – AIHA

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9. PHYSICAL AND CHEMICAL DATA:

APPEARANCE.....:	LIQUID
COLOR.....:	CLEAR/PALE YELLOW
ODOR.....:	NEGLIGIBLE
MOLECULAR WEIGHT.....:	APPROX. 500 (POLYISOCYANATE)
MELT POINT/FREEZE POINT.....:	NE
BOILING POINT.....:	APPROX. 382°F (194°C)
VAPOR PRESSURE.....:	POLYISOCYANATE-APPROX 7.5 X 10^{-5} MMHG @ 20°C
	SPECIFIC GRAVITY.....: 1.14 @ 68°F
SOLUBILITY IN WATER.....:	INSOLUBLE - REACTS SLOWLY WITH WATER TO LIBERATE CO_2 GAS
% VOLATILE BY WEIGHT.....:	NEGLIGIBLE

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10. STABILITY AND REACTIVITY:

STABILITY.....: Stable under normal conditions.

HAZARDOUS POLYMERIZATION.....: May occur; Contact with moisture or other materials which react with isocyanates or temperatures above 400°F may cause polymerization.

INCOMPATIBILITIES.....: Water, amines, strong bases, alcohols, metal compounds and surface active materials.

INCOMPATIBILITY CONDITIONS.....: None known.

DECOMPOSITION PRODUCTS.....: By high heat and fire: carbon dioxide, carbon monoxide, oxides of nitrogen, HCN, HDI.

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11. TOXICOLOGICAL INFORMATION:

TOXICITY DATA FOR: HDI homopolymer materials except where indicated.

ACUTE TOXICITY

ORAL LD50.....: Estimated to be greater than 10000 mg/kg (rats).
(Based on the results of actual tests conducted using specific HDI-homopolymer products.)

DERMAL LD50.....: Estimated to be greater than 5000 mg/kg (rabbits).
(Based on the results of actual tests conducted using specific HDI-homopolymer products.)

INHALATION LC50..: Lower respiratory (pulmonary) irritant. LC50 values range from 137-1150 mg/m3 were obtained in rats exposed to aerosols. (4H exp.)
EYE EFFECTS.....: Severe irritant capable of inducing corneal injury (Rabbit); maximum primary eye irritation score: 54.6/110 for a 24 hr. exposure.
SKIN EFFECTS.....: Moderate irritant; primary dermal irritation score: 3.4/8.0 (rabbit)
SENSITIZATION.....: Pulmonary and dermal sensitizer in humans. Delayed dermal sensitization was observed in guinea pigs. However, the respiratory sensitization potential of isocyanate assessed in guinea pigs was negative. Evidence exists that cross-sensitization between HDI and other isocyanates, particularly hydrogenated MDI and TDI, can occur.

SUBCHRONIC TOXICITY.....: Rats exposed to a HDI homopolyer (isocyanate type, at aerosol concentrations of 4.3, 14.7 and 89.8 mg/m3 for three weeks exhibited respiratory distress and inflammation of the nasal passages at 14.7 mg/m3 and above. At the 89.8 mg/m3 level, inflammatory lesions at many sites of the lungs were also observed. The No Observable Effect Level (NOEL) was 4.3 mg/m3. Rats were also exposed to an HDI homopolymer (isocyanurate type for 13 weeks at aerosol concentrations of 0.5, 3.3 and 26.4 mg/m3. Body weight gain of male rats of the 26.4 mg/m3 group were slightly reduced toward the end of the study. The lung weight to body weight ratio was significantly increased in the male and female rats of the 26.4 mg/m3 group. Histopathologic diagnosis of these animals revealed inflammatory changes and formation of fibrous tissue at the point of injury in the respiratory tract. In addition the lung function tests at the end of the study provided evidence of a chronic obstructive lung disorder in rats of the 26.4 mg/m3 group. The (NOEL) in this study is considered to be 3.3 mg/m3.

OTHER TOXICITY DATA.....: Mice were exposed to liquid aerosol of an HDI homopolymer mixed with acetone for three hours. The irritation potential expressed as the RD50 (the concentration which is predicted to reduce respiratory rate 50%) was 20.8 mg/m3 (95% confidence interval= 18.3 to 23.9 mg/m3). Pulmonary (lung) irritation was observed first, followed by sensory (eye, nose, and throat) irritation.

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12. ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION AVAILABLE

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Waste must be disposed of in accordance with federal, state and local environment control regulations. Incineration is the preferred method. Empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. DO NOT HEAT OR CUT EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH. See section 5 and 10.

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14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Polisocyanate
FREIGHT CLASS.....: Chemicals, NOI (Isocyanate), NMFC 60000
PRODUCT LABEL.....: Urocel 100, B COMPONENT

	DOT (DOMESTIC SURFACE)
HAZARD CLASS OR DIVISION	Non-Regulated

	IMO/IMDG CODE (OCEAN)
HAZARD CLASS DIVISION NUMBER	Non-Regulated

	ICAO /IATA (AIR)
HAZARD CLASS DIVISION NUMBER	Non-Regulated

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15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
TSCA STATUS.....: On TSCA Inventory
CERCLA REPORTABLE QUANTITY : None
SARA TITLE III:
SECTION 302 EXTREMELY
HAZARDOUS SUBSTANCES..: None
Section 311/312
HAZARD CATEGORIES.....: Immediate Health Hazard; Delayed Health Hazard; Reactive Hazard
SECTION 313
TOXIC CHEMICALS.....: None
RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic.

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of this MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

COMPONENT NAME /CAS NUMBER	CONCENTRATION	STATE CODE
Homopolymer of HDI 28182-81-2	Essentially 100%	PA3, NJ4

NJ4 = New Jersey Other – included in 5 predominant ingredients > 1%
PA3 = Pennsylvania Non-Hazardous present at 3% or greater.

CALIFORNIA PROPOSITION 65
To the best of our knowledge, this product contains no levels of listed substances, which the state of California has found to cause cancer, birth defects or other reproductive effects.

MASSACHUSETTS SUBSTANCE LIST (MSL)
Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products. To the best of our knowledge, this product contains no substances at a level which could require reporting under the statute.

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16. OTHER INFORMATION:

HMIS RATINGS:	Health	Flammability	Reactivity
	2*	1	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
*=Chronic Health Hazard

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