MATERIAL SAFETY DATE SHEET

1. MATERIAL IDENTIFICATION

Product Name: **AQUABOND AB-1000 PART A**

EMERGENCY PHONE: For product emergency involving spill, leak, fire, exposure, or accident call CHEMTREC at (800) 424-9300. For all other inquires please call AquaBond, LLC at (714) 961-1420**.**

2. COMPOSITION

			Exposure Limits		
COMPONENTS	**CAS NO**	**PERCENT**	**ACGIH (TLV)**	**OSHA (PEL)**	**Other**
Dicyclohexylmethane – 4,4' – diisocyanate	5124 – 30 – 1	30 – 60	0.005 ppm	0.005 ppm	0.01 ceiling

Abbreviations: N.E.: Not Established; RF: Respirable Fraction; TP: Total Particulate

3. HEALTH HAZARDS IDENTIFICATION

Routes of Exposure: Eyes: Yes Skin: Yes Inhalation: No

Acute Eye Contact: Liquid, vapors and mist are irritating and can cause tearing, reddening and swelling of the eyes possibly accompanied by stinging sensation.

Acute Skin Contact: Dicyclohexylmethane – 4,4' - diisocyanate is a primary skin irritant. It reacts with protein and moisture and can cause irritation. Symptoms of skin irritation include: redness swelling, rash, scaling and blistering. Dicyclohexylmethane – 4,4' - diisocyanate is also a potent sensitizer. Experience indicates that direct contact is the route of exposure most likely to cause sensitization. Once sensitized, an individual may react even to airborne levels below the TLV with the following symptoms: itching and tingling or the earlobes and neck, rash, hives, swelling of the arms and legs or other symptoms common to allergic dermatitis. These symptoms may be immediate or delayed.

Chronic Skin Contact: Prolonged contact can cause reddening, swelling, rash, scaling, blistering and in some cases, skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapor. Animal tests have indicated that respiratory sensitization can result from skin contact with Dicyclohexylmethane – 4,4' - diisocyanate.

Acute Inhalation: Inhalation of Dicyclohexylmethane – 4,4' - diisocyanate concentrations above the TLV can irritate the mucous membranes in the respiratory tract causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function. Persons with a preexisting, nonspecific bronchial hyper reactivity can respond to concentrations below the TLV with similar symptoms. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema. These effects are usually reversible. Chemical or hypersensitive pneuonitis with flu-like symptoms has also been reported.

3. HEALTH HAZARDS IDENTIFICATION (Continued)

Chronic Inhalation: As a result of previous repeated overexposures or a single large dose certain individuals develop isocyanate sensitization, which will cause them to react to a later exposure to isocyanate at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma 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 an 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. Overexposure to isocyanates has also been reported to cause lung damage including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent.

Acute Ingestion: Irritation and corrosive action can occur in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain nausea, vomiting and diarrhea.

4. FIRST AID MEASURES

Eyes: Flush with copious amount of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Refer individual to a physician or ophthalmologist for immediate follow-up.

Skin: Remove contaminated clothing. Wash affected skin 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 after area is washed.

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. Consult a physician.

Ingestion: Do not induce vomiting. Give one to two cups of milk or water to drink. Do not give anything by mouth to an unconscious person. Consult a physician.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point:	More than 200 ^{o}F (Setaflash)
Explosive Limits:	Not applicable
Auto-Ignition Temperature:	Not applicable.
Hazardous Decomposition Products:	Carbon monoxide, oxides of nitrogen, traces of hydrogen cyanide, MDI vapors or aerosols.
Unusual Fire or Explosion Hazards:	Closed containers may explode when exposed to extreme heat or burst when contaminated with water.

Fire Fighting Instructions: Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. During a fire, vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Carbon dioxide, foam, dry chemical.

6. ACCIDENTAL RELEASE MEASURES

Evacuate nonessential personnel. Remove all sources of ignition and ventilate the area. Cover the spill with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well – ventilated area (outside) and react with a neutralizing solution of water (90%), concentrated ammonia (3 – 8%), and detergent (2%). Add about ten parts of neutralizer per part of isocyanate, with mixing. Allow standing uncovered for 48 hours to let carbon dioxide escape. Clean-up: Decontaminate floor with decontamination solution letting stand for at least 15 minutes.

7. HANDLING AND STORAGE

Store between 77 °F and 122 °F 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 range is 86 °F – 104 °F: If container is exposed to temperatures above 122 °F, it can be pressurized and possibly rupture violently. Dicyclohexglmethane-4 4'diisocyanate reacts slowly with water to form carbon dioxide gas. Avoid contact with skin and eyes. Do not breathe vapor or mists.

8. EXPOSURE CONTROLS, PERSONNEL PROTECTION

Ventilation: Local exhaust should be used to maintain levels below the TLV when material is processed, heated or spray applied. Standard reference sources regarding industrial ventilation should be consulted for guidance about adequate ventilation.

Respiratory Protection: In some situations, a respirator may be necessary in addition to ventilation. Positive pressure air – supplied respirators are mandatory when: airborne concentrations of isocyanate exceed 0.005 ppm; operations are performed in a confined space or area with limited ventilation; or material is heated or sprayed. Air – purifying respirators are not generally recommended due to the poor warning properties of isocyanates.

Skin Protection: Any area of skin that could potentially come in contact with this material, must be covered by a permeation resistant barrier (i.e. rubber gloves, neoprene apron, chemical suit, etc.) When there is a potential for splash, a full chemical suit is required. When the application results in vapor or mist, a full permeation resistant suit including head covering, and face shield, gloves, and overshoes is required.

Eye Protection: Safety glasses, splash goggles or face shield. Contact lenses should not be worn.

Monitoring: Isocyanate exposure levels must be monitored. Monitoring of airborne isocyanates in the breathing zone of individuals should become part of the overall employee exposure characterization program. NIOSH and OSHA have developed monitoring techniques of isocyanates.

Medical Surveillance: Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include pre-employment and periodic medical exam nations with pulmonary function tests (FEV, FVC as a minimum). Persons with asthmatic – type conditions, chronic bronchitis, or other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once diagnosed with isocyanate sensitization, no further exposure can be permitted.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear liquid
Odor:	Odorless
Physical State:	Viscous Liquid
Boiling Point:	Not determined
Specific Gravity:	Not determined
Vapor Pressure:	Not available
Solubility in Water:	Reacts slowly with water to generate carbon dioxide.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable

Incompatibility: Water, amines, strong bases alcohols. Will cause some corrosion to copper alloys and aluminum.

Conditions to Avoid: Contamination with water.

Hazardous Decomposition Products: None

Hazardous Polymerization: May occur. Contact with moisture, other materials, which can react with isocyanates, or temperatures above 400°F, may cause polymerization.

11. TOXICOLOGICAL INFORMATION

Dicyclohexylmethane – 4,4' – diisocyanate:

LD_{50} Acute Oral Rat:	166 mg/kg
LD_{50} Acute Dermal Rabbit:	10,000 mg/kg
LC_{50} Acute Inhalation:	434 mg/m^3 - 4 hr (rat); 295 mg/m^3 - 4 hr (male rat) 307 mg/m^3 - 4 hr (female rat)
Eye Irritation:	Mild, reversible irritation (Rabbit)
Skin Irritation:	Irritating and potent sensitizer (guinea pig) Irritating (rabbit)
Sensitization:	Two inhalation studies with guinea pigs indicated possible respiratory sensitization. One study also with guinea pigs indicated that Dicyclohexylmethane–4, 4'–diisocyanate is not a respiratory sensitizer. An additional study where Dicyclohexylmethane–4, 4'–diisocyanate was applied intradermally and followed by an inhalation challenge resulted in a weak sensitization response in guinea pigs.
Mutagenicity (isocyanate)	Ames test negative for mutagenicity with and without metabolic activation.

	Literature Referenced	Carcinogen		
Ingredients	**Target Organ and Other Health Effects**	**NTP**	**IARC**	**OSHA**
Dicyclohexylmethane–4, 4'–diisocyanate	ALG, IRA, RES	NO	NO	NO

Abbreviations:

ALG – Allergen IRR – Irritant RES – Respiratory

Note: Due to this product's physical composition, the release or generation of dust is not expected to occur under normal conditions of use.

12. ECOLOGICAL INFORMATION

Aquatic toxicity - Brachydanio 96 hrs; LCO = 0.69 mg/L; LC_{50} = 1.20 mg/L; LC_{100} = 2.76 mg/L (values for isocyanate)

13. DISPOSAL CONSIDERATIONS

Recommended method of disposal: Incinerate following EPA and local regulations. Not a RCRA Hazardous Material for Disposal

14. TRANSPORT INFORMATION

D.O.T. Classification: Other Regulated Substances, Liquid, N.O.S. (Hydrogenated Methylene Diisocyanate)
Hazard Class: 9 **UN #:** UN3082 **PG:** III **ERG #:** None **Hazard Labels:** None

I.A.T.A. Classification: Aviation regulated liquid, N.O.S. (Hydrogenated Methylene Diisocyanate)
Hazard Class: 9 **UN #:** UN3334 **PG:** III **ERG #:** None **Hazard Labels:** None

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA:

The chemical components of this product are contained on section 8(B) of the chemical substance inventory list (40CFR710).

SARA Title III Information

Section 313 - Toxic Chemicals:

Pursuant to section 313 of SARA Title III, this product contains a toxic chemical in a concentration in excess of 1 percent of the mixture, or 0.1 percent if a carcinogen.

COMPONENTS	CAS NO	PERCENT
Dicyclohexylmethane – 4,4' – diisocyanate	5124 – 30 – 1	30 – 60

Section 311 / 312 - Hazard Categories

Pursuant to section 311/312 of SARA title III, the physical and health hazard categories for this product are as follows:

Immediate (Acute) Health Hazard:	Yes	Fire Hazard:	No
Delayed (Chronic) Health Hazard:	No	Sudden Release of Pressure Hazard:	No
Reactivity Hazard:	No		

STATE REGULATIONS / RIGHT TO KNOW

California Proposition 65: No California Proposition 65 chemicals are known to be present.

16. OTHER INFORMATION

HMIS Hazards:	Health: 3	Flammability: 1	Reactivity: 1
NFPA Hazards:	Health: 3	Flammability: 1	Reactivity: 1

This information is intended solely for the use of individuals trained in the use of this particular system.

AquaBond, LLC urges each customer or recipient of this MSDS to study it carefully in order to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals that are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate in order to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1 - notify its employees, agents, contractors, and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety. 2 - furnish this same information to each of its customers for the product. 3 - request its customers to notify their employees, customers, and other users of the product of this information.

The information contained herein is based on the data available to us and is believed to be correct. However, AquaBond, LLC makes no warranty, expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof. AquaBond, LLC assumes no responsibility for injury from the use of the product described herein.