

MATERIAL SAFETY DATA SHEET (MSDS)

FIRST ISSUE DATE: 11 August 2000

Section 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Aquawrap® or Aquapreg® Carbon**

MFR'S NAME: Air Logistics Corporation, 925 North Todd Avenue, Azusa CA 91702
EMERGENCY PHONE: 800-424-9300 (CHEMTREC) GENERAL INFORMATION: 626-633-0294

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT	%	CAS #	EXPOSURE LIMITS
4,4'-Diphenylmethane diisocyanate	<1	101-68-8	0.051mg/m ³ ; TWA ACGIH
Diphenylmethane diisocyanate	<12	26447-40-5	N.E.
Polyisocyanate based on MDI	<38	none	N.E.
Carbon (graphite) synthetic fiber	>50	7440-44-0	15 mg/m ² total/5 mg/m ² respirable
Borosilicate glass fiber roving	>2	65997-17-3	5mg/m ³ free floating fiber; PEL OSHA
Epoxy sizing	<0.55	Proprietary	Not determined

Section 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Uncured fiber reinforced polymer system. Harmful if inhaled. May cause allergic skin reaction. May cause allergic respiratory reaction. Causes skin and eye irritation. Causes respiratory tract irritation.

POTENTIAL HEALTH EFFECTS:

EYE:

- Causes eye irritation; cured material is difficult to remove.

SKIN:

- May cause skin sensitization. May cause dermatitis. Causes skin irritation. Will react with skin moisture.

INGESTION:

- Harmful if swallowed. Ingestion is not an expected route of entry in industrial or commercial uses.

INHALATION:

- When working inside or without adequate ventilation, possible irritation of the respiratory system can occur, causing a variety of symptoms such as dryness of the throat, tightness of the chest and shortness of breath. Allergic conditions can occur in certain individuals with high sensitivity to isocyanates; this may result in asthma-like symptoms. May cause respiratory sensitization. May cause lung damage.

CHRONIC EFFECTS:

- May cause long-term lung damage or chemical asthma. Chronic skin contact may cause dermatitis or react with the skin. Cured material is hard to remove from the skin.

SIGNS & SYMPTOMS:

- Tightness in the throat; difficulty breathing; wheezing, cough, shortness of breath; redness of skin and irritation. Flu-like symptoms, either immediate or delayed by several hours.

PRIMARY ROUTES OF ENTRY: inhalation, skin contact, ingestion, eye contact.

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

Section 4: FIRST AID MEASURES

EYE:

- Wipe excess from eyelid outer surfaces, then immediately flood with continuous, large quantities of water or eyewash for at least 15 minutes. Get prompt medical attention.

SKIN:

- Wipe away excess. Remove contaminated clothing. Flood affected skin with large quantities of water and wash with soap & water. For severe exposures or if irritation develops get medical attention.

INGESTION:

- If swallowed, do NOT induce vomiting. If conscious, give victim one or two glasses of water or milk. Call a physician or poison control center immediately for further instructions. Never give anything by mouth to an unconscious person.

INHALATION:

- Move victim to fresh air. Restore and support continued breathing. If breathing is difficult, give oxygen. Get immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

FLASH POINT: >145°C (>293°F) {Setaflash Closed Cup} UEL/LEL: n.d.a.

OSHA Flammability Classification: Combustible Liquid – Class IIIB AUTOIGNITION: n.d.a.

COMBUSTION PRODUCTS: CO, CO₂, NO_x, & misc. hydrocarbons with traces of HCN & MDI vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Closed containers may rupture when exposed to extreme heat. Use water spray to keep fire-exposed containers cool

EXTINGUISHING MEDIA: Use foam, CO₂, dry chemical, water fog.

SPECIAL FIREFIGHTING PROCEDURES: Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. During a fire, MDI vapors and other irritating, highly toxic gasses may be generated by thermal decomposition (See Stability and Reactivity). At temperatures greater than 400° F (204° C), polymeric MDI can polymerize and decompose which can cause pressure build-up in closed containers. Explosive rupture is possible. Therefore, use cold water to cool fire-exposed containers.

Section 6: ACCIDENTAL RELEASE MEASURES

Keep non-essential personnel a safe distance away from the area. Avoid breathing vapors. Notify appropriate authorities if necessary. Avoid contact. Before attempting cleanup, refer to hazard caution information in other sections of this MSDS form. Clean up material with inert absorbent material and be sure to use protective clothing and gloves. Note: water or ambient humidity will cause material to cure.

Section 7: HANDLING AND STORAGE

SHIPPING CONTAINERS: Due to its hydroscopic nature and the fact that the material cures by exposure to ambient humidity, individual lengths are shipped in sealed pouches. The pouches are then packaged in larger containers for transport.

HANDLING: Keep container tight and upright. Do not open individual pouches prematurely as the material will cure. Avoid skin and eye contact. Wash thoroughly after handling. Avoid breathing of vapor or spray mists. Do not handle until all safety precautions have been read and understood. Empty pouches should not be used. Use with adequate ventilation.

STORAGE: Store only in well-ventilated dry areas. Do not refrigerate.

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS: Sufficient ventilation in pattern and volume should be provided in order to maintain air contaminant levels below recommended exposure limits.

RESPIRATORY PROTECTION: This product contains isocyanates, which have poor odor warning properties. If occupational exposure limits are exceeded, a NIOSH/MSHA approved supplied air respirator is required. Observe OSHA regulations (29CFR 1910.134) for respirator use.

SKIN PROTECTION: Use neoprene, nitrile, or rubber gloves to prevent skin contact.

EYE PROTECTION: Use safety eyewear including safety glasses with side shields and chemical goggles.

OTHER PROTECTIVE EQUIPMENT: Use disposable or impervious clothing if work clothing contamination is likely. Remove and wash contaminated clothing before reuse. Use long-sleeved shirt to minimize skin exposure.

HYGENIC PRACTICES: Wash hands before eating, smoking, or using toilet facility. Food or beverages should not be consumed anywhere this product is handled or stored. Wash thoroughly after handling.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE: 694 F	VAPOR DENSITY: Is heavier than air
APPEARANCE: Buff white pre-impregnated glass cloth composite	ODOR THRESHOLD: N.D.
PHYSICAL STATE: Semi solid	EVAPORATION RATE : N.D.
ODOR: Slight	DENSITY, LB/GAL: 1.1
SOLUBILITY IN H₂O: Insoluble, resin cures with The addition of H ₂ O	SPECIFIC GRAVITY: .15
FREEZE POINT: N.D.	pH : N.A.
VOLATILE BY WEIGHT: 0.0 %	VOLATILE BY VOL. : 0.0 %
VAPOR PRESSURE: Less than 10 mmHg.	
COEFFICIENT OF WATER/OIL DISTRIBUTION: N.D.	

Section 10: STABILITY AND REACTIVITY

CONDITIONS TO AVOID: High temperatures.

INCOMPATIBILITY: Amines, acids, water, hydroxyl, or active hydrogen compounds. Note that the material will cure if exposed to water or ambient humidity.

HAZARDOUS DECOMPOSITION PRODUCTS: Monomeric isocyanate, traces of hydrogen cyanide, nitrogen dioxide. Carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions. Product will cure when exposed to water.

STABILITY: This product is stable under normal storage conditions.

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

Section 11: TOXICOLOGICAL INFORMATION

TOXICITY DATA FOR: Diphenylmethane Diisocyanate (Monomeric and Polymeric)

ACUTE TOXICITY

ORAL LD50. : Greater than 15,800 mg/kg (Rat)

DERMAL LD50. : Greater 5010 but less than 7,940 mg/kg (Rabbit)

INHALATION LC50. The 4-hour LC50 for polymeric MDI in rats ranges from 370 to 490 mg/m³.

The LC50 for monomeric MDI was estimated to be between 172 and 187 mg/m³.

EYE EFFECTS. : Slight to moderate irritation.

SKIN EFFECTS. : Slight to moderate irritation.

SENSITIZATION. MDI has been shown to produce dermal sensitization in laboratory animals. Evidence of respiratory sensitization has also been observed in guinea pigs. In addition, there is some evidence suggestive of cross-sensitization between different types of diisocyanates.

CHRONIC TOXICITY: In a combined chronic inhalation toxicity/oncogenicity study, rats were exposed to an aerosol of polymeric MDI for 6 hours per day, 5 days per week for one or two years. The exposure concentrations were 0, 0.2, 1.0 and 6.0 mg/m³. Microscopic examination of tissues revealed the effects of irritation to the nasal cavity and lungs in animals exposed to 1.0 and 6.0 mg/m³. The No Observable Effect Level (NOEL) was 0.2 mg/m³.

CARCINOGENICITY: In the study described above (See CHRONIC TOXICITY), the occurrence of pulmonary adenomas and a single pulmonary adenocarcinoma was considered to be related to MDI. These tumors were observed only in rats exposed to the high concentration of 6.0 mg/m³.

MUTAGENICITY: MDI has been reported by NIOSH to be mutagenic to salmonella typhimurium bacteria in the presence of a mammalian activating system. Recent work done by M. Anderson, at the Danish School of Pharmacy in Denmark and published in the Scandinavian Journal of Work and Environmental Health, also shows a positive result for the MDI. There is not full agreement in the scientific community on the significance of these Ames test results and their relationship to human safety in the risk of cancer in man.

DEVELOPMENTAL TOXICITY: Rats were exposed to polymeric MDI at air concentrations of 0, 1, 4 and 12 mg/m³ during days 6 – 15 of gestation. Maternal Toxicity (including mortality) was observed at the highest concentration of 12 mg/m³ accompanied by embryo and fetal toxicity. However, no teratogenic effects were observed even at this lethal concentration.

OTHER TOXICITY DATA: No conclusive evidence has been developed to indicate that the MDI is carcinogenic, teratogenic or that it causes reproductive effects in animals or in humans.

TOXICITY DATA FOR MUTAGENICITY: MDI has been reported by NIOSH to be mutagenic to salmonella typhimurium bacteria in the presence of a mammalian activating system. Recent work done by M. Anderson, at the Danish School of Pharmacy in Denmark and published in the Scandinavian Journal of Work and Environmental Health, also shows a positive result for the MDI. There is not full agreement in the scientific community on the significance of these Ames test results and their relationship to human safety in the risk of cancer in man.

OTHER TOXICITY DATA: No conclusive evidence has been developed to indicate that the MDI is carcinogenic, teratogenic or that it causes reproductive effects in animals or in humans.

Section 12: ECOLOGICAL INFORMATION

Aquatic Toxicity: LC50 – 24 hours (static): Greater than 500 mg/liter for Daphnia magna, Limnaea stagnalis, and Zebra fish (Brachydanio rerio) for both polymeric and monomeric MDI.

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

Section 13: DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Disposal should be done in accordance with Federal (40CFR Part 261), state and local environmental control regulations. If waste is determined to be hazardous, use licensed hazardous waste transporter and disposal facility.

EMPTY BAG PRECAUTIONS: After opening a small amount of residual resin material is present on the inside of the sealed pouches. This material will cure in an hour or so from the ambient humidity. Once the material has cured it poses no known hazard.

UNUSED MATERIAL: Unused material should be allowed to cure in the ambient humidity. This takes an hour or so. Once the material is cured it can be handled and poses no known hazard.

Section 14: TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: DIPHENYLMETHANE-4,4' DIISOCYANATE SOLUTION

DOT HAZARD CLASS: NOT REGULATED FOR SHIPMENTS OF LESS THAN 74540 POUNDS PER CONTAINER.

EMERGENCY RESPONSE GUIDE NUMBER: 55

DOT UN/NA NUMBER: NOT APPLICABLE

PACKING GROUP: III

Section 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

OSHA SECTION 313:

This product contains the following substances subject to the reporting requirement of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

-----CHEMICAL NAME-----	CAS NUMBER:	WT % IS LESS THAN
4,4'-Diphenylmethane diisocyanate	101-68-8	.5%

TOXIC SUBSTANCES CONTROL ACT:

INVENTORY STATUS

The chemical substances in this product are on the TSCA Section 8

EXPORT NOTIFICATION:

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

-----CHEMICAL NAME-----	CAS NUMBER
Diisodecyl phthalate - DIDP	68515-49-1
Monochlorobenzene	108-90-7

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

OSHA STATUS:

This product is a hazardous under the criteria of the Federal OSHA Hazard Commission Standard 29 CFR 1910.1200.

TSCA STATUS:

On TSCA Inventory.

CERCLA REPORTABLE QUANTITY:

500 lbs. for 4,4' diphenylmethane diisocyanate, CAS # 101-68-8.

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES – NONE

SECTION 311/312 HAZARD CATEGORIES – Immediate health hazard; delayed health hazard; reactive hazard.

SECTION 313 – 4,4' Diphenylmethane diisocyanate (CAS# 101-68-8) Approximately 0.5%.

RCRA STATUS:

This product is not listed as a hazardous waste. To the best of our knowledge, this product does not meet the criteria of a hazardous waste when it is discarded in its purchased form. However under RERA, it is the responsibility of the user of this product to determine, at the time of disposal, whether a product meets any of the criteria for a hazardous waste. This is because the product transforms during use.

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

<u>Component name/ CAS number</u>	<u>Concentration %</u>	<u>State Code</u>
4,4'diphenylmethane diisocyanate (MDI) 101-68-8	0.5	PA1, FL, IL, RI, NJ1, NJ4, CN2
Diphenylmethane diisocyanate 26447-40-5	7.7	NJ4
Polyisocyanate, based on MDI NJTSRN (31765300002)-5317P	27	PA3, NJ4

FI – Florida substance act

IL – Illinois toxic substance list

MA – Massachusetts hazardous substance list

NJ1 – New Jersey hazardous substance list

NJ2 – New Jersey other - other in 5 predominant ingredients > 1%

NJTSRN – New Jersey trade secret registry number

PA1 – Pennsylvania hazardous substance list

PA3 – Pennsylvania non-hazardous present at 3% or greater

RI- Rhode Island list of designated substances

CN2 – Canada WHMIS ingredient disclosure list over .1%

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.

PENNSYLVANIA RIGHT-TO-KNOW:

The following non-hazardous ingredients are present in the product at greater than 3%:

-----CHEMICAL NAME-----	CAS NUMBER
Titanium dioxide	53320-86-8

CALIFORNIA PROPOSITION 65:

This product does not contain any chemicals regulated under California Proposition 65.

INTERNATIONAL REGULATIONS: AS FOLLOWS –

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADA WHMIS CLASS: No information available.

Section 16: OTHER INFORMATION

NFPA: Not actually rated by NFPA. Following are Air Logistics, Corp. interpolations:

HEALTH 3 FIRE 1 REACTIVITY 1 OTHER none

WHMIS

HEALTH 2* FIRE 1 REACTIVITY 1 OTHER none

2* indicates a chronic hazard. See Section 3

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.0 lbs./gal.

0 grams/lt.

ABBREVIATIONS: N/A = not applicable; N.D.A. = no data available; N.E. = not established

END OF MSDS

ATTENTION: No representation is made as to the accuracy or correctness of the information contained herein, other than to state that it is presented by this organization in good faith and we believe it to be correct and accurate per the limits of our understanding and training as of the date of first publication. The user or handler of this product is warned to take the most conservative and safest interpretation possible of all information contained herein and to use the most extreme personal protection measures and exposure limitations prudently dictated by the specific usage or handling situation, this MSDS information and good industrial safety and hygiene practices.