

**ERGON ARMOR**

**BH5710 Component 2**

**MSDS No. EA078**

Date of Preparation: **March 8, 2010**

Revision No. 2

**Section 1 – Chemical Product and Company Information**

<b>Product/Chemical Name:</b>	BH5710 Component 2
<b>Chemical Family:</b>	Aromatic Isocyanate
<b>CAS Number:</b>	9016-87-9
<b>Other Designations:</b>	
<b>General Use:</b>	Surface coating
<b>Manufacturer:</b>	Ergon Armor, 450 Funston, Kansas City, Kansas 66115, (913) 371-8555; Hours of Operation 8:00 am – 5:00 pm; ERGON 24 Hour Emergency Phone Number 1-800-222-7122; CHEMTREC (North America)1-800-424-9300; CHEMTREC (International) 1-703-527-3887

**Section 2 – Composition / Information on Ingredients**

Ingredient Name	CAS Number	% Wt
4,4'-Diphenylmethane Diisocyanate	101-68-8	<45
Higher Oligomers of MDI	9016-87-9	45-55
Diphenylemethane Diisocyanate (MDI)	5873-54-1	1-10

INGREDIENT	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH IDHL
	TWA	STEL	TWA	STEL	TWA	STEL	
4,4'-Diphenylmethane Diisocyanate	None estab.	0.02 ppm	0.005 ppm	None estab.	None estab.	None estab.	None estab.
Higher Oligomers of MDI	None estab.	None estab.	None estab.	None estab.	None estab.	None estab.	None estab.
Diphenylmethane Diisocyanate	None estab.	None estab.	None estab.	None estab.	None estab.	None estab.	None estab.

**Section 3 – Hazards Information**

**EMERGENCY OVERVIEW**

<p align="center">HMIS H-2 F-1 R-1 PPE* * Sec.8</p>
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**POTENTIAL HEALTH EFFECTS**

**Primary Entry Routes:** Inhalation and absorption.

**Target Organs:** Skin, Eye, Respiratory System

**Acute Effects**

**Inhalation:** MDI vapors or mist at 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 preexisting, non specific bronchial hyper reactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema. These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms has also been reported. These symptoms can be delayed up to several hours after exposure.

**Eye:** Liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However, damage is usually reversible.

**Skin:** Isocyanates react with skin protein and moisture and can cause irritation, which may include the following symptoms: reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove.

**Ingestion:** Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.

**Carcinogenicity:** Product components listed as a IARC, NTP, ACGIH, or OSHA carcinogen:  
none

**Medical Conditions Aggravated by Long-Term Exposure:** Asthma, other respiratory disorders, skin allergies, eczema

## ERGON ARMOR

### BH5710 Component 2

MSDS No. EA078

Date of Preparation: **March 8, 2010**

Revision No. 2

**Chronic Effects:** 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 of 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. 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 several cases for several years. Sensitization can either be temporary or permanent. Prolonged contact with the skin 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 vapors. Animal tests have indicated that respiratory sensitization can result from skin contact with MDI.

#### Section 4 – First Aid Measures

**Inhalation:** Leave area to breathe fresh air. Avoid further overexposure. If symptoms persist, get medical attention.

**Eye Contact:** Flush with water for at least 15 minutes while holding eye lids apart. Get medical attention immediately.

**Skin Contact:** Clean area of contact thoroughly using soap and water. If irritation, rash or other disorders develop, get medical attention immediately.

**Ingestion:** Do not induce vomiting unless advised by a physician. Call nearest Poison Control Center or Physician immediately.

**After first aid, get appropriate in-plant paramedic or community medical support.**

**Special Precautions/Procedures:** The petroleum hydrocarbons in this product are a complex mixture of paraffinic, naphthenic, and aromatic hydrocarbons. As with other petroleum products, the aromatic compounds are present in varying concentrations and structures. Some of these compounds may be those which have been shown to result in tumor formation in animals under laboratory conditions. The concentrations of aromatic compounds in this product require that the precautions outlined in this MSDS be followed to minimize personnel exposure.

Provide adequate ventilation to keep vapors below allowable exposure levels. Use PPE appropriate for the task.

#### Section 5 – Fire Fighting Measures

**Flash Point:** 390°F

**Flash Point Method:** PMCC

**Ignition Temperature:** Not available

**LEL:** Not available

**UEL:** Not available

**Flammability Classification:**

**Extinguishing Media:** Dry chemical, foam, and carbon dioxide. Water spray for large fires.

**Unusual Fire or Explosion Hazards:** If container is exposed to high heat, 400°F it can be pressurized and possible rupture. MDI reacts slowly with water to form carbon dioxide gas. This gas can cause sealed containers to expand and possibly rupture.

**Hazardous Combustion Products:** Carbon monoxide, oxides of nitrogen, traces of HCN, MDI vapors.

**Fire-Fighting Instructions:** During a fire, MDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. At temperatures greater than 400°F, 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.

**Fire-Fighting Equipment:** Full emergency equipment with self contained breathing apparatus and full protective clothing should be worn by fire fighters.



#### Section 6 – Accidental Release Matters

**Spill/Leak Procedures:** Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment, including respiratory equipment during clean up. If a

## ERGON ARMOR

**BH5710 Component 2**

**MSDS No. EA078**

Date of Preparation: **March 8, 2010**

Revision No. 2

transportation spill, call CHEMTREC 800-424-9300. If temporary control of isocyanate vapor is required, blanket with protein foam.

**Small Spills:** Stop spill at source if possible. Isolate and confine by diking, or similar method. Remove discharged material. In a container, use neutralizing solution; 80% water, 20% Tergitol TMN-10, or; 90% water, 3-8 % concentrated ammonia, and 2% detergent. Let stand uncovered for 48 hours to allow carbon dioxide to escape.

**Large Spills:**

**Containment:** For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.

**Cleanup:** Mix with inert absorbent material such as soil, sand, or oil dry, to stabilize.

**Regulatory Requirements:** Notify local health and pollution control agencies as appropriate. Follow applicable OSHA regulations (29 CFR 1900.120). Subject to hazardous waste treatment, storage, and disposal requirements under RCRA for characteristic of ignitability (D001). For disposal follow all federal, state, and local regulations regarding solid waste.

### Section 7 – Handling and Storage

**Handling Precautions:** Avoid contact with skin and eyes. Do not breathe aerosols or vapors. Warning properties (eye, nose and throat irritations) are not adequate to prevent chronic overexposure from inhalation.

**Storage Requirements:** Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

**Regulatory Requirements:** None known.

### Section 8 – Exposure Controls / Personal Protection

**Engineering Controls:** Use only in well ventilated areas. Provide maximum ventilation in enclosed areas.

**Ventilation:** Local exhaust should be used to maintain levels below the TLV whenever MDI is processed, heated, or spray applied. Standard reference sources regarding industrial ventilation (i.e., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.

**Respiratory Protection:** Concentrations greater than the LTV can occur when MDI is sprayed, heated or used in a poorly ventilated area. In such cases, or whenever concentrations of MDI exceed the TLV or are not known, respiratory protection must be worn. A supplied air respirator (either positive pressure or continuous flow type) is required. In an emergency situation, a self-contained breathing apparatus may be used. MDI has poor warning properties, since the concentration at which MDI can be smelled is substantially higher than the maximum exposure limit. Observe OSHA regulations for respirator use (29 CFR 1910.134)

**Protective Clothing/Equipment:** Use suitable impervious nitrile or butyl rubber gloves and protective apparel to reduce exposure. Wear appropriate eye protection (chemical safety goggles and/or face shield) to prevent eye contact per OSHA eye- and face-protection regulations (29 CFR 1910.133). Do not wear contact lenses. Do not touch eyes with contaminated body parts or materials. Prevent contact with shoes and clothing.

**Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

**Contaminated Equipment:** Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

**Comments:** Isocyanate exposure levels must be monitored.

### Section 9 – Physical and Chemical Properties

**Physical State:** Liquid

**Appearance and Odor:** Brown-black liquid with a mild musty odor

**Odor Threshold:** ND

**Vapor Pressure:** 5 mmHg@ 77°F (MDI)

**Vapor Density (Air = 1):** 8.5 (MDI)

**Water Solubility:** Negligible.

**Other Solubilities:** No data.

**Boiling Point:** 406°F

**Freezing/Melting Point:** <32°F

**Viscosity:** 200 cps @77°F

**Refractive Index:** No data.

## ERGON ARMOR

### BH5710 Component 2

MSDS No. EA078

Date of Preparation: **March 8, 2010**

Revision No. 2

**Formula Weight:** Est. 350 lb/lb-mole

**Surface Tension:** No data.

**Density:** Est. 10.3 lb/gal

**% Volatile:** Negligible

**Specific Gravity (H<sub>2</sub>O = 1, at 4°C):** Est. 1.241

**Evaporation Rate:** No data.

**pH:** Not available

### Section 10 – Stability and Reactivity

**Stability:** Stable at room temperature in closed containers under normal storage and handling conditions.

**Polymerization:** Hazardous polymerization may occur when exposed to moisture, other material which react with isocyanates, or temperature above 400°F

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

**Conditions to Avoid:** Contamination with water and high temperatures.

**Hazardous Decomposition Products:** Primary decomposition products are carbon monoxide, oxides of nitrogen, traces of HCN, MDI vapors and aerosols.

### Section 11 – Toxicological Information

**Eye Effects:** Vapors may cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

**Skin Effects:** May result in skin sensitivity, such as irritation, rashes, and dermatitis.

**Acute Inhalation Effects:** 4 hour LC<sub>50</sub> for MDI in rats ranges from 370-490 mg/m<sup>3</sup>

**Acute Oral Effects:** (rat) Greater than 10,000 mg/kg

**Carcinogenicity:** In the study of chronic effects (see below) pulmonary adenocarcinoma was considered to be related to MDI. This was observed in rats exposed to 6.0 mg/m<sup>3</sup>.

**Mutagenicity:** No data.

**Teratogenicity:** No data.

**Chronic Effects:** In a combined chronic inhalation toxicity/oncogenicity study, rats were exposed to an aerosol MDI for 6 hours/day, 5 days/week for one or two years. The exposure concentration were 0, 0.2, 1.0 and 6.0 mg/m<sup>3</sup>. 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/m<sup>3</sup>.

### Section 12 – Ecological Information

**Ecotoxicity:** Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes.

**Environmental Fate:**

**Environmental Transport:** No data.

**Environmental Degradation:** No data.

**Soil Absorption/Mobility:** No data.

### Section 13 – Disposal Considerations

**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**Disposal Regulatory Requirements:** Subject to hazardous waste treatment, storage, and disposal requirements under RCRA. Follow Federal, state, and local regulations for disposal of solid waste.

**Container Cleaning and Disposal:** Recommend using a non-hazardous solvent to remove the product. Follow Federal, state, and local regulations for disposal of the waste material, regardless of its waste classification.

### Section 14 – Transport Information

*When shipped in individual packages less than the RQ, material is not subject to HMR.*

**Shipping Name:** Environmentally Hazardous Substances, liquid, n.o.s. (contains 4, 4' – Diphenylmethane Diisocyanate (MDI))

**Packaging Authorizations:**  
**a) Exceptions:** 173.155  
**b) Non-bulk Packaging:** 173.203

**Quantity Limitations:**  
**a) Passenger Aircraft, or Railcar:** NA  
**b) Cargo Aircraft Only:**

## ERGON ARMOR

### BH5710 Component 2

MSDS No. EA078

Date of Preparation: March 8, 2010

Revision No. 2

**Hazardous Substance:** MDI

**c) Bulk Packaging:** 173.241

NA

**Shipping Symbols:** NA

**Hazard Class:** 9

**ID No.:** UN3082

**Packing Group:** III

**Label:** Class 9

**RQ:** 11,111 lbs

**Shipping Description:** "UN3082,  
Environmentally Hazardous  
Substances, liquid, n.o.s. (contains 4,  
4' - Diphenylmethane Diisocyanate  
(MDI)), 9, III"

**Vessel Stowage**

**Requirements:**

a) **Vessel Stowage:** A

b) **Other:**

### Section 15 – Regulatory Information

#### EPA Regulations:

##### RCRA

RCRA Hazardous Waste Number: Not listed.

RCRA Hazardous Waste Classification (40 CFR 261): Not currently a characteristic waste. Up to user at time of disposal to make waste determination.

##### CERCLA

CERCLA:

CERCLA Reportable Quantity (RQ): 11,111 lbs

##### SARA

SARA 311/312 Codes: Immediate Health Hazard; Delayed Health Hazard

SARA Toxic Chemical: Polymeric Diphenylmethane Diisocyanate

SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed.

##### OSHA Regulations

This product is hazardous under the criteria of Federal OSHA Hazard Communication Standard 29 CFR 1910.1200

**State Regulations:** Listed in state hazardous substance list for PA, FL, IL, MA, NJ, CN

### Section 16 – Other Information

#### Revision Notes:

##### Additional Hazard Rating Systems:

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