MATERIAL SAFETY DATA SHEET

1. PRODUCT AND PREPARATION INFORMATION

Manufactured For: The Easthill Group

dba/ The Eastwood Company

263 Shoemaker Road Pottstown, PA 19464

USA & Canada: 800-345-1178 Outside USA: (610) 323-2200

Emergency Contact: Chem-Trec: 800-424-9300

Product Code......51654Z

Chemical Family......Aromatic Isocyanate Pre-polymer

II. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients

Ingredient Name/CAS No.	Exposure Limits	Concentration	
4,4 –Diphenylmethane Diiso	ocyanate	Upper Bound 20%	
101-68-8	OSHA: 0.02 ppm Ceiling 0.20 mg/m ³ Ceiling		
	ACGIH: 0.005 ppm TWA 0.051 mg/m ³ TWA		
Higher Oligomers of MDI			
9016-87-9	OSHA: Not Established	30-35%	
	ACGIH: Not Established		
Diphenylmethane Diisocyar	nate (2,2'; 2,4')	•••••	
26447-40-5	OSHA: Not Established	0-5%	
	ACGIH: Not Established		

III. HAZARDS IDENTIFICATION

Emergency Overview

WARNING: Color: Dark Brown; Form: Liquid; Odor: Slightly Musty Odor; May cause eye, skin and respiratory tract irritation; Harmful if inhaled; May cause allergic skin reaction; May cause lung damage; Use cold water spray to cool fire-exposed containers to minimize the risk of rupture; Toxic gases/fumes are given off during burning or thermal decomposition; Closed container may explode under extreme heat.

POTENTIAL HEALTH EFFECTS:

Route(s) Of Entry Skin: Contact from liquid and aerosols (spray application).

Inhalation: Although MDI is low in volatility, an inhalation hazard can exist from MDI aerosols or vapors formed during hasting from a granting.

heating, foaming or spraying.

Human Effects and Symptoms of Overexposure:

Acute Inhalation: MDI vapors or mist at concentrations above the TLV 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 a pre-existing, nonspecific bronchial hyperactivity 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 (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills) has also been reported. These symptoms can be delayed up to several hours after exposure.

Chronic Inhalation: As a result of previous repeated overexposures or a single large mist dose, certain individuals develop isocyanate sensitization (chemical asthma) 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 Skin Contact: 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.

Chronic Skin Contact: Prolonged contact can cause skin 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 sensitizations can result from skin

contact with MDI. This data reinforces the need to prevent direct skin contact with MDI. (See Toxicological Information, Sensitization).

Acute Eye Contact: Liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and the injury is slow to heal. However, damage is usually reversible. See First Aid measures for treatment.

Chronic Eye Contact: None Found.

Acute 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.

Chronic Ingestion: None Found.

Carcinogenicity: Neither MDI nor polymeric MDI are listed by the NTP, IARC or regulated by OSHA as carnicogens. See two year inhalation study in Toxicological Information, Carcinogenicity.

Medical Conditions Aggravated By Exposure: Asthma, other respiratory disorders (bronchitis, emphysema, bronchial hyperreactivity), skin allergies, eczema.

IV. FIRST AID MEASURES

- **First Aid For Eyes:** Flush with copious amounts of water, preferably luke warm water for at least 15 minutes, holding eyelids open all the time. Refer individuals to physician or ophthalmologist for immediate follow-up.
- First Aid For Skin: Remove contaminated clothing. Wash affected skin thoroughly with soap and water. Wash contaminated clothing thoroughly before re-use. 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 the area is washed.
- **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 maybe immediate or delayed upto several hours. Consult physician should this occur.
- First Aid For Ingestion: Do not induce vomiting. Give 1 to 2 cups of milk or water to drink. Do not give anything by mouth to an unconscious person. Consult physician.
- Note To Physician: Eyes. Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. Skin. This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion. Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound. Respiratory. This compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

V. FIRE FIGHTING MEASURES

Flash Point: 415° F (213° C) Pensky-Martens Closed Cup (ASTM D-93)

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 fire fighters. During a fire, MDI vapors and other irritating and highly toxic gases may be generated by thermal decomposition and combustion. (See Stability and Reactivity). At temperatures above 400^{0} F (204^{0} 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.

VI. ACCIDENTAL RELEASE MEASURES

Spill or 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. (See Employee Protection Recommendations). Major Spill: If temporary control of isocyanate vapor is required, a blanket of protein foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed but not sealed, container for disposal. Minor Spill: Absorb isocyanates with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution: mixture of water (80%) with non-ionic surfactant Surfonic N-95 (20%), or ; water (90%), concentrated ammonia (3-8%), and detergent (2%). Add about 10 parts of neutralizer per part of isocyanate, with mixing. Allow to stand uncovered for 48 hours to let carbon dioxide escape. Clean-up: Decontaminate floor with decontamination solution letting stand for at least 15 minutes.

VII. HANDLING AND STORAGE

Storage Temperature (Min/Max): 64⁰ F (18⁰ C)/ 86⁰ F (30⁰ C)

Shelf Life: 6 months

Special Sensitivity: If container is exposed to high heat, 400^{0} F (204^{0} C) it can be pressurized and possibly rupture. MDI reacts slowly with water to form carbon dioxide gas. This gas 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. Avoid contact with skin and eyes. Do not breathe aerosols or vapors. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Exposure to vapors of

heated MDI can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

VIII. PERSONAL PROTECTION

- **Eye Protection Requirements:** Liquid chemical goggles. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment chemical goggles should be used in combination with a full face-shield.
- **Skin Protection Requirements:** Permeation resistant gloves (butyl rubber, nitrile Rubber, polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered by the cream to a minimum.
- **Ventilation Requirements:** 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.
- Respirator Requirements: Concentrations greater than the TLV 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).
- 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. Monitoring techniques have been developed by NIOSH, and OSHA.
- Medical Surveillance: Medical supervision of all employees who handle or come in contact with isocyanate is recommended. These should include pre-employment and periodic medical examinations with pulmonary function tests (FEV, FVC as a minimum). Persons with asthmatic-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 warnings and data sheet instructions.

IX. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form...... Liquid Color...... Dark Brown

Odor...... Slightly musty odor

Molecular weight...: Trade Secret pH...: Not Established

Melting/Freezing Point..... Below 32^0 F (0^0 C) for MDI

Solubility in Water...... Not Soluble. Reacts slowly with water to liberate

carbon dioxide gas.

Specific Gravity.....: 1.185 @, 77⁰ F (25⁰ C)

Vapor Pressure...... Less than 10⁻⁵ mmHg at 77⁰ F (25⁰ C) for MDI

X. STABILITY AND REACTIVITY

Stability...... This is a stable material

Nitrogen, traces of HCN, MDI vapors or aerosols.

XI. TOXICOLOGICAL INFORMATION

Toxicity Data For: Diphenylmethane Diisocyanate (Monomeric and Polymeric) **Acute Toxicity**

Oral LD50.....: Greater than 10,000 mg/kg (Rat)
Dermal LD50...... Greater than 6,200 mg/kg (Rabbit)

Inhalation LC50...........: The 4-hour LC50 for Polymeric MDI in rats ranges from 370 to 490 mg/m³. The 4-hour LC50 for monomeric MDI in rats was estimated to be between 172 and 187 mg/m³.

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.

- per week for one or two years. The exposure concentrations were 0, 0.2, 1.0 and 6 mg/m^3 . 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^3 . The No Observable Effect Level (NOEL) was 0.2 mg/m^3 .
- **Mutagenicity**.....: Positive (Salmonella microsome test with metabolic activation; cell transformation assay) as well as negative (mouse lymphoma specific locus mutation test with or without metabolic activation) results have been observed "in-vitro". The use of certain solvents which rapidly hydrolyze MDI is suspected of producing mutagenicity in some of these studies. MDI was negative in an "in-vivo" (mouse micronucleus) assay.
- **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.

XII. ECOLOGICAL INFORMATION

Ecology Data For: Diphenylmethane Diisocyanate (monomeric and Polymeric) **Aquatic Toxicity**............: LC50 – 24 hr. (static): Greater than 500 mg/liter for Daphne magna, Limnea Stagnalis and Zebra fish (Brachydanio rerio) for both monomeric and polymeric MDI.

XIII. DISPOSAL CONSIDERATIONS

- **Waste Disposal Method**.....: Waste must be disposed of in accordance with federal, state and local environmental control regulations. Incineration is the preferred method.
- Empty Container Precautions.: Empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. *Do not heat or cut empty container with electric or gas torch*. (See Fire Fighting Measures and Stability and Reactivity). Gases may be highly toxic.

XIV. TRANSPORTATION INFORMATION

Technical Shipping Name....: Methylene diphenyl diisocyanate Freight Class Bulk...... Methylene diphenyl diisocyanate

Freight Class Package......: Chemicals, NOI (Isocyanate), NMFC 60000

Product Label Product Label Established

DOT (Domestic Surface)

Proper Shipping Name....... Other Regulated Substances, Liquid, N.O.S.*

Hazard Class or Division...... 9

UN/NA Number: NA 3082

Packing Group....: III

DOT Product RQ lbs (kgs).....: 13888 lbs (6299.6 kgs)

* When in individual containers of less than the product RQ, this material ships as non-regulated.

IMO/IMDG CODE (Ocean)

Hazard Class Division Number....: Non-Regulated

ICAO/IATA (Air)

Hazard Class Division Number....: Non-Regulated

XV. 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...: 5000 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.

Section 313

Toxic Chemicals.......: Polymeric Diphenylmethane Diisocyanate, CAS #

9016-87-9, 100%;

Contained in this polymeric product is 4,4' –

Diphenylmethane Diisocyanate, CAS # 101-68-8;

Upper Bound 20%.

RCRA Status...... MDI is not listed as a hazardous waste. To the best of

Our Knowledge, MDI does not meet the criteria of a hazardous waste if discarded in its purchased form. However, under RCRA, it is the responsibility of the user of the products to determine, at the time of the disposal, whether a product meets any of the criteria for a hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity

characteristics under the new Toxicity Characteristics Leaching Procedure (TCLP) 40 Code of Federal Regulations 261.20-24.

The following chemicals are specifically listed by individual states; other product specific health and safety data in other 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.

Component Name/

CAS Number	Concentration	State Code
4,4' –Diphenylmethan	e Diisocyanate	
101-68-8	Upper Bound 20%	PA1, FL, IL, MA, RI, NJ1, CN2
Higher Oligomers of M	MDI	
9016-87-9	30-35%	PA3, NJ4
Diphenylmethane Diis	ocyanate (2,2'; 2,4')	
26447-40-5	0-5%	PA3, NJ4

FL = Florida substance List

IL = Illinois Toxic Substances List

MA = Massachusetts Hazardous Substance List

NJ1 = New Jersey Hazardous Substance List

NJ4 = New Jersey Other- included in 5 predominant ingredients > 1%

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 0.1%.

XVI. OTHER INFORMATION

NFPA 704M Ratings	: Health	Flammabili	ity Re	activity	Other
	3	1		1	0
	0=Insignificant	1=Slight	2= Moderate	3= High	4=Extreme

HMIS Ratings: Health Flammability Reactivity

3* 1 1

0-Minimal 1=slight 2=Moderate 3= Serious 4= Severe

* Chronic Health Hazard

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MATERIAL SAFETY DATA SHEET

I. PRODUCT INFORMATION

Manufactured For: The Easthill Group

dba/ The Eastwood Company

263 Shoemaker Road Pottstown, PA 19464

USA & Canada: 800-345-1178 Outside USA: (610) 323-2200

Emergency Contact: Chem-Trec: 800-424-9300

Product Code......51654Z

Chemical Name......Polyether Polyol Blend.

Synonyms.....None

CAS No......None Assigned; Mixture

Formula......Mixture
Mol. Wt......N/A

Date......Dec 14, 2007

II. HAZARDOUS COMPONENTS

Component CAS NO. PEL-Source Concentration

Mixture Not Assigned N.D. 100%

III. PHYSICAL DATA

Boiling Point: Not Established **Specific Gravity/ Bulk Density**: $1.04 (H_20=1)$ **Vapor Pressure, mm Hg @ 20^{0}C**: Less than 1.0 **Soluble**

Appearance & Odor: Straw or black colored liquid/ No odor

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point/Method: 320⁰F (for major component of mixture)

Flammable Limits(STP): Not Determined

Extinguishing Media: CO₂, Dry Chemical, Foam Water Fog

Fire & Explosion Hazard: Low Hazard

Special Fire Fighting Procedures: Turnout gear, self-contained breathing

apparatus for protection against suffocation

and toxic decomposition products.

Part-B

V. HEALTH HAZARD DATA

Ingestion: Slightly hazardous in case of ingestion.

Eye Contact: Mild eye irritant.

Skin Contact: Mildly irritating in case of skin contact.

Inhalation: Vapors given off by heated material may be harmful.

Emergency and First Aid Procedures:

Eyes: Flush with copious amounts of water for at least 15 minutes. Consult

physician.

Skin: Wash material off of the skin with plenty of soap and water. Consult

physician if irritation persists. Do not apply grease or ointments. Remove

contaminated clothing and launder before use.

Inhalation: Move to an area free from risk of further exposure. Get immediate medical

attention.

Ingestion: **DO NOT INDUCE VOMITING**. If person is conscious and can

swallow, immediately give two glasses of water. If vomiting occurs, give fluids again. Never give anything by mouth to an unconscious person.

Consult physician.

VI. REACTIVITY DATA

Stability: Stable under normal conditions. **Hazardous Decomposition Products**: CO, CO₂, NOx, SO₂, SO₃, H₂S. **Incompatibility**(chemicals to avoid): Strong acids and oxidizing agents.

Hazardous Polymerization: Will not occur.

VII. TOXICOLOGICAL INFORMATION

No Specific Data Available

Ingestion: Slightly hazardous in case of ingestion

Inhalation: Vapors given off by heated material may be harmful.

Eye Contact: Mild irritant in case of eye contact.

Carcinogenicity: Not listed as a carcinogen by NTP, IARC or OSHA.

Mutagenic Effects:None known.Reproductive Effects:None known.Teratogenic Effects:None known.

VIII. SAFE HANDLING AND USE INFORMATION

Eye Protection: Safety glasses or goggles required; do not wear contact

lenses.

Skin Protection: Gloves and clothing as necessary to prevent skin contact.

Ventilation: Local exhaust ventilation as necessary to control any air

contaminants to within their exposure limits during use of

41.:- 1---4

this product.

Part-B

Respiratory Protection: Appropriate respiratory protection shall be worn when

applied engineering controls are not adequate to protect against inhalation exposure. Use in well ventilated areas.

IX. SPILL OR LEAK PROCEDURES

Spill and Leak Procedures: Dike with absorbent material and place in an over pack for

disposal.

Waste Disposal: Dispose of according to local, state and federal regulations.

Under the CERCLA/RCRA regulations currently in effect,

this product is not regulated as a hazardous material.

X. FEDERAL REGULATORY INFORMATION

TSCA 8(b) inventory: All ingredients listed

SARA Section 302: None

Sara 311/312 Hazard Categories: Health--Acute; Physical--None

SARA 313 Chemical: No ingredients listed

NFPA Hazard Rating:

Health Fire Reactivity Other 2 1 0 0

0= Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

We believe that the information contained in this MSDS is current. Since the use of this information and the conditions of use of the product are not within our control, it is the user's obligation to determine the conditions of safe use of this product. The information herein is given in good faith but no warranty expressed or implied is made.