MATERIAL SAFETY DATA SHEET

POLYFOAM PRODUCTS, INC.
P.O. BOX. 1539
TOMBALL, TX 77375-1539

****
FOR CHEMICAL EMERGENCY * SPILL * LEAK * FIRE * EXPOSURE * ACCIDENT * CALL CHEMTREC-DAY OR NIGHT (800)-424-9300.
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* SECTION l - PRODUCT INFORMATION *

Manufacturer's name	Polyfoam Products, Inc.	**Phone number:**	(281) 350-8888
Product Name:	TITETSET® COMPONENT 'A'	**Chemical Family**:	Diisocyanate
Synonyms:	Froth A Component	**Chemical name:**	Not Applicable (mixture)
C.A.S. Number:	9016-87-9		

Date Prepared: January 13, 1999 **Date Revised: July 16, 2004**

*SECTION II - INGREDIENTS *

COMPONENTS	**% w/w**	**CAS#**	**OSHA- PEL**
Polymeric Diphenylmethane Diisocyanate (polymeric MDI)	>80	9016-87-9	not listed
Contains:			
4,4'-Diphenylmethane Diisocyanate (4,4' MDI) (approx. 45%)		101-68-8	0.02 ppb ceiling
MDI isomers/oligomers		9016-87-9	not listed
HFC-134a	<20	811-97-2	not listed

* SECTION III - PHSYICAL / CHEMICAL CHARACTERISTICS *

Appearance:	Liquid and gas under pressure
Color:	Brown
Odor:	Slight musty odor
Molecular Weight	not applicable (mixture)
Melt Point/Freeze Point:	Below 32°F (0°C)
Boiling Point:	less than 0° F
Vapor Pressure:	151 psig @ 25° C
Vapor Density:	3.03 @ 25°C (Air = 1)
Viscosity:	130 cps @ 77° F (25° C)
Specific Gravity:	1.23 @ 77°F (25°C)
% Volatile by Volume:	less than 20%

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* SECTION III - PHSYICAL / CHEMICAL CHARACTERISTICS * (Cont.)

Solubility In Water: Not Soluble. Reacts slowly with water to liberate CO_2 gas.

* SECTION IV - FIRE AND EXPLOSION HAZARD DATA *

FLASH POINT (METHOD) °F (°C): 425.0°F (218°C)
EXTINGUISHING MEDIA: Dry chemical; carbon dioxide, appropriate chemical foam, water spray for large fires**.** If water is used, very large quantities are required. Reaction with water may be vigorous. Contain runoff water with temporary barriers.
SPECIAL FIRE FIGHTING PROCEDURES/UNUSUAL FIRE OR EXPLOSION HAZARDS: Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. Containers are equipped with a pressure relief valve intended to vent any excessive build up of pressure exerted by gases generated by heat, thermal decomposition or combustion. (See Section VIII). Therefore, use cold water to cool fire-exposed containers.

* SECTION V - HUMAN HEALTH DATA *

Hazardous Ingredients:	**OSHA PEL CEILING**
4,4' Diphenylmethane Diisocyanate	0.02 PPM
HFC-134a	not listed

ROUTES OF ENTRY: **Skin Contact -** From liquid and aerosols (spray application). **Inhalation - A**n inhalation hazard can exist from aerosols or vapors formed during heating, foaming, or spraying. Vapor reduces oxygen available for breathing and is heavier than air.
HUMAN EFFECTS AND SYMPTONS OF OVEREXPOSURE:
ACUTE INHALATION: **Acute Inhalation**- 4-4' MDI vapors or mists 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 hyperreativity can respond to concentrations below the 4-4' MDI TLV with similar symptoms as well as asthma attack. Exposure well above the 4-4' MDI TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These affects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g. fever and chills) has also been reported. These symptoms can be delayed up to several hours after exposure. **Chronic Inhalation** - As a result of previous repeated over-exposures to 4-4' MDI or a single large 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 reddening, swelling, rash, scaling, blistering, and in some cases skin sensitization. Individuals who have developed a 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. 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 injury is slow to heal. However, damage is usually reversible. See section VI for treatment.
CHRONIC EYE CONTACT: None Found

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* SECTION V - HUMAN HEALTH DATA * (Cont.)

ACUTE INGESTION: Can result in irritation and corrosive damage in the mouth, stomach tissue and the digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting, and diarrhea.
CHRONIC INGESTION: None Found
MEDICAL CONDITIONS:
Aggravated By Exposure - Asthma, other respiratory disorders (bronchitis, emphysema, bronchial hyperactivity), skin allergies, eczema.
CARCINOGENICITY - None of the ingredients are listed by NTP, IARC, or regulated by OSHA as carcinogens.

* SECTION VI - EMERGENCY AND FIRST AID PROCEDURES *

EYE CONTACT: Flush with copious amount of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Refer individual for physician or ophthalmologist for immediate follow-up.
SKIN CONTACT: 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 the area is washed.
INHALATION: Move to 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 physician should this occur.
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 burns. If burned, treat as thermal burn. **Ingestion** - Treat symptomatically. There is no specific antidote. Inducing vomiting is contradicted 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 to this material should be removed from exposure to any isocyanate.

* SECTION VII - EMPLOYEE PROTECTION RECOMMENDATIONS *

EYE PROTECTION - Liquid chemical goggles or full-face shield. 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 - 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.
RESPIRATORY PROTECTION: Concentrations greater than the 4,4' MDI TLV can occur during spraying, heating, or use in a poorly ventilated area. In such cases, or whenever concentrations of 4,4' MDI exceed the TLV, respiratory protection must be worn. A supplied-air respirator or a self-contained breathing apparatus is recommended. In situations where material is not sprayed or heated and a supplied air or self-contained apparatus is unavailable or its use impractical, at least an air-purifying respirator equipped with an organic cartridge and a particulate filter must be worn. HOWEVER, THIS SHOULD BE PERMITTED ONLY FOR SHORT PERIODS OF TIME (LESS THAN ONE HOUR) AT RELATIVELY LOW CONCENTRATIONS (AT OR NEAR THE TLV). However, due to the poor warning properties of 4,4' MDI, proper fit and timely replacement of filter elements must be ensured. Observe OSHA regulations for respirator use (29 CFR 1910.134).

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* SECTION VII - EMPLOYEE PROTECTION RECOMMENDATIONS * (cont.)

VENTILATION: Local exhaust should be used to maintain levels below the 4,4' MDI TLV whenever TITESET® COMPONENT 'A' is processed, heated or spray applied. For spray applications, an air-supplied respirator must be worn. Standard reference sources regarding industrial ventilation (i.e., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.
MONITORING: 4,4' MDI exposure levels should be monitored by accepted monitoring techniques to ensure that the TLV is not exceeded.
MEDICAL SURVEILLANCE: Medical supervision of all employees who handle or come in contact with 4,4' MDI is recommended. These should include pre-employment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory type diseases or recurrent skin eczema or sensitization should be excluded from working with TITESET® COMPONENT 'A'. Once a person is diagnosed as sensitized by 4,4' MDI, no further exposure can be permitted.
OTHER: Safety showers and eye wash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

* SECTION VIII - REACTIVITY DATA *

STABILITY: This is a stable material
POLYMERIZATION: May occur if in contact with moisture or other materials which react with isocyanates. May occur at temperatures over 400°F (204°C), may cause polymerization.
INCOMPATIBILITY: (Materials to Avoid) - Water, amines, strong bases, alcohols. Will cause some corrosion to copper alloys and aluminum.
HAZARDOUS DECOMPOSITION PRODUCTS: By high heat and fire - carbon monoxide, oxides of nitrogen, traces of HCN, MDI vapors or aerosols, HFC-134a vapor.

* SECTION IX - SPILL OR LEAK PROCEDURES *

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment, including respiratory equipment during cleanup. (See Section VII).
MAJOR SPILL: Call Polyfoam Products, Inc. at 1-(281)-350-8888. If transportation spill, call Chemtrec 1-(800) 434-9300. If temporary control of isocyanates 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, containers of disposal.
MINOR SPILL: Absorb TITESET® COMPONENT 'A' 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 Tergitol TMN-10 (20%), or; water (90%), concentrated ammonia (3-8%) and detergent (2%). Add about 10 parts of neutralizer per part of TITESET® COMPONENT 'A' with mixing. Allow to stand uncovered for 48 hours to let CO^2 escape.

CLEAN-UP: Decontaminate floor with decontamination solution letting stand for at least 15 minutes.
CERCLA (SUPERFUND) REPORTABLE QUANTITY: None reported.

WASTE DISPOSAL METHOD: Waste must be disposed of in accordance with federal, state, and local environmental control regulations. Incineration is the preferred method. 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 Sections IV and VIII) Vapors and gases may be highly toxic.

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* SECTION X - SPECIAL PRECAUTIONS AND STORAGE DATA *

STORAGE TEMPERATURE (MIN./MAX.): 64°F (18°C) / 86°F (30°C)
AVERAGE SHELF LIFE: 18 months

SPECIAL SENSITIVITY
(HEAT, LIGHT, MOISTURE): If container is exposed to high heat, 400°F (204°C) or higher, or contaminated with water, pressure can be generated. Containers are equipped with a pressure relief valve intended to vent any excessive build up of pressure exerted by gases generated by heat or moisture contamination.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: 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 or heated TITESET® COMPONENT 'A' 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.

* SECTION XI - SHIPPING DATA *

TECHNICAL SHIPPING NAME: Compressed Gas N.O.S.
FREIGHT CLASS BULK: Chemicals, NOI (Isocyanate)
FREIGHT CLASS PACKAGE: Chemicals, NOI (Isocyanate), NMFC 60000
PRODUCT LABEL: Product Label Established

DOT

PROPER SHIPPING NAME: **1,1,1,2- tetrafluoromethane mixture**
HAZARD CLASS OR DIVISION: 2.2
UN/NA NUMBER: UN 1956
DOT PRODUCT RQ LBS (KGS): None
HAZARD LABEL(s): Non Flammable Gas
HAZARD PLACARD(s): Non Flammable Gas

Transportation Emergency Telephone Number: 1-800-424-9300 (CHEMTREC)

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* SECTION XII - ANIMAL TOXICITY DATA *

ACUTE TOXICITY
ORAL, LD50: Greater than 15,800 mg/kg (Rats) for 4-4'MDI
DERMAL, LD50: Greater than 5010 but less than 7,940 mg/kg (Rabbits) for 4-4'MDI
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. The 4 hour LC50 for HFC-134a is 220,000 ppm in rats.
EYE EFFECTS: Slightly irritating. A maximum primary eye irritation score for polymeric MDI of 12.0/110 (24 hr) was obtained. This score is fairly typical for a number of MDI products.
SKIN EFFECTS: Slight to moderate irritant. Primary dermal irritations scores are typically below 3.4/8.0 (Draize).
SENSITIZATION: Has been known to produce dermal sensitization in guinea pigs, rabbits, and dogs. Although not well defined in experimental animals models, TITESET® COMPONENT 'A' can induce pulmonary and dermal sensitization in humans**.** In addition, there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur.
CHRONIC TOXICITY: In a chronic inhalation exposure study, rats were exposed to an aerosol of polymeric MDI for 6 hours per day, 5 days per week for a period of 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 same two year inhalation study described above (See Chronic Toxicity), the occurrence of pulmonary adenomas (benign tumors) and a single pulmonary adenocarcinoma (malignant tumor) was considered to be related to the exposure. These tumors were observed only in rats exposed to the high concentration of 6.0 mg/m3.
MUTAGENICITY: Monomeric MDI is positive in the Ames essay (with hepatic microsomal activation). However, it was negative in an in vivo-in vitro micronucleus assay.
AQUATIC TOXICITY: LC_{50} - 24HR (static): Greater than 500mg/liter for Daphnia magna, Limnea stagnalis, and zebra fish (Brachydanio rerio) for both polymeric and monomeric MDI.
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 even at this lethal concentration.

* SECTION XIII - REGULATORY INFORMATION *

OSHA STATUS: This product is hazardous under the criteria of the federal OSHA Hazard Communication Standard 29CFR 1910.1200..
TSCA STATUS: On TSCA inventory.
CERCLA REPORTABLE QUANTITY: 5000 lb 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
TOXIC CHEMICALS: Polymeric Diphenylmethane Diisocyanate, cas# 9016-87-9, 100%
4,4'-Diphenylmethane Diisocyanate, CAS# 101-68-8**;** Upper Bound 45%

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 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.

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* SECTION XIV - OTHER REGULATORY INFORMATION *

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 -DIPHENYLMETHANE-DIISOCYANATE (MDI) 101-68-8	UPPER BOUND 45%	PA1, MA, NJ1, NJ4, CN2
DIPHENYLMETHANE-DIISOCYANATE (2, 2; 2, 4) 26447-40-5	UPPER BOUND 10%	PA3, NJ4
HIGHER OLIGOMERS OF MDI 9016-87-9	UPPER BOUND 55%	PA3, NJ4
PHENYL ISOCYANATE 103-71-9	TRACE	MA

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.
CN2 = CANADA WHMIS INGREDIENT DISCLOSURE LIST OVER 0.1°

NFPA 704M RATINGS:	Health	Flammability	Reactivity	Other
	3	1	1	

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

Polyfoam Products, Inc.'s method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. NFPA ratings are provided by Polyfoam Products, Inc. as a customer service.

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Prepared By: Patrick Donahue Date: January 13, 1999

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