

# Safety Data Sheet



**PetraFlex Primer**

## 1. IDENTIFICATION

24 HOUR EMERGENCY ASSISTANCE	MANUFACTURER/GENERAL MSDS ASSISTANCE
CHEM-TEL 1-800-255-3924	<b>Petra Polymers</b> Tel.: (888)-497-3872 1610 E. Miraloma Ave. Placentia, CA 92870

**PRODUCT IDENTIFIER/NAME:** PetraFlex Primer – PART B  
**RECOMMENDED USE:** Chemical intermediate for polyurethane

## 2. HAZARD(S) IDENTIFICATION

### HAZARD CLASSIFICATION:

Acute Oral Toxicity Category 4  
Acute Dermal Toxicity Category 4  
Acute Vapors Toxicity Category 5  
Skin Corrosion Category 1C  
Eye Irritation Category 2  
Skin Sensitizer Category 1  
Respiratory Sensitizer Category 1  
Germ Cell Mutagenicity Category 2  
Carcinogenicity Category 2  
TOST: Single Exposure Category 2  
TOST: Repeated Exposure Category 2

### NFPA ratings (scale 0 – 4):

<b>HEALTH</b>	<b>2</b>
<b>FIRE</b>	<b>0</b>
<b>REACTIVITY</b>	<b>2</b>
<b>SPECIAL</b>	<b>-</b>

### NFPA HAZARD RATING:

4= EXTREME    2= MODERATE    0= INSIGNIFICANT  
3= HIGH        1= SLIGHT



### HAZARD PICTOGRAMS:

**SIGNAL WORD:** Danger!

**PHYSICAL APPEARANCE:** Dark brown liquid with faint musky odor.

## HAZARD STATEMENTS:

**INHALATION:** In a combined chronic inhalation toxicity/oncogenicity study, rats were exposed to an aerosol of polymeric mdi for 6 hours/day, 5 days/week, for one or two years, at exposure concentrations of 0, 0.2, 1.0 and 6.0 mg/m'. Microscopic examination of tissues revealed the effects of irritation to the nasal cavity and lungs in animals exposed to the two highest concentrations. The no observable effect level (noel) was 0.2 mg/m. Pulmonary adenomas and a single pulmonary adenocarcinoma. Were observed in this study, but were considered to be related to mdi. These tumors were observed only in rats exposed at the highest concentration.

**SKIN AND EYE:** 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.

**INGESTION:** May cause burning inside the mouth accompanied by nausea, vomiting and diarrhea.

**HEALTH HAZARDS (ACUTE AND CHRONIC):** Repeated skin contact may cause persistent irritation or dermatitis.

**MUTANGENICITY:** 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. However, mdi gave negative results in an in vivo (mouse micronucleus) assay.

**PRECAUTIONARY STATEMENTS:** Do not breathe dust/fume/gas/mist/vapors/spray. Use personal protective equipment as required. Do not handle until all safety precautions have been read and understood. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention. IF SWALLOWED: Get immediate medical advice/attention. IF exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical advice/attention.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

<i>Polymeric diphenylmethane diisocyanate</i>	(CAS 9016-87-9)	< 50%
<i>4,4' - Diphenylmethane diisocyanate (MDI)</i>	(CAS101-68-8)	<45%

## 4. FIRST AID MEASURES

### Eye Contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention immediately.

### Skin Contact

In case of skin contact, wash affected areas with plenty of soap and water. Immediately remove contaminated clothing and shoes. Wash clothing and clean shoes thoroughly before reuse. Get medical attention if irritation develops. An MDI study has demonstrated that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water.

### Inhalation

If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately. If breathing is labored, oxygen should be administered by qualified personnel. Treatment is symptomatic for primary irritation or bronchospasm.

### Ingestion

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention.

### Notes to physician

Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for a least 48 hours.

## 5. FIRE-FIGHTING MEASURES

Combustion products may include:

Carbon Oxides (CO, CO<sub>2</sub>), Nitrogen Oxides (NO, NO<sub>2</sub>, ...), Hydrocarbons and HCN.

Suitable Extinguishing Media:

Carbon dioxide, dry chemical, foam, water fog or fine spray. Alcohol resistant foams (ATC type)

are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream; may spread fire.

#### Special Fire Fighting Procedures:

Isolate area and keep unnecessary people away. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) with a full-face piece and appropriate protective clothing, including: safety helmet, coat, pants, boots and gloves. Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant clothing with SCBA. If this will not provide sufficient fire protection, consider fighting fire from a protected location or a safe distance. Consider use of unmanned

hose holder or monitor nozzles. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Contain firewater run-off if possible. Do not use direct water stream; may spread fire. Use water spray to cool fire exposed containers and fire-affected zone until fire is out. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration of the container. Move container away from fire area if this is possible without hazard.

#### Unusual Fire/Explosion Hazards:

Down-wind personnel must be evacuated. Do not reseal contaminated containers; a hazardous build-up of pressure could result. Product reacts with water to produce CO<sub>2</sub> gas. Reaction may produce heat and/or toxic flammable gases. Reaction may be violent. Containers may rupture from gas generation in a fire situation; elevated temperatures accelerate this reaction. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke produced when product burns.

## 6. ACCIDENTAL RELEASE MEASURES

### Spill and Leak Procedures

Evacuate and isolate the area. Keep personnel out of low areas. Keep upwind of spill to avoid inhalation of vapors. Ventilate area of leak or spill. Use appropriate safety equipment. Keep unnecessary and unprotected personnel from entering the area. If available, use foam to suppress vapors.

Immediately contact emergency personnel. Clean-up should be only be performed by trained personnel. People dealing with major spillage should wear full protective clothing including respiratory protection. Use suitable protective equipment (Section 8).

### Environmental Precautions

Prevent liquid from entering into soil, ditches, sewers, waterways and/or ground water.

### Methods for Clean Up

Contain spilled material if possible. Absorb with sawdust, vermiculite, dirt, sand, clay, cob grit or Milsorb. Avoid materials such a cement powder (may generate heat). Collect material in suitable and properly labeled open-top containers. DO NOT place in sealed containers. Suitable containers include polylined fiber pats, plastic drums or metal drums. Wash the spill area clean with liquid decontaminant and large quantities of water.

Contain and absorb large spills onto an inert, non-flammable absorbent carrier (such as earth or sand). Shovel into open-top drums or plastic bags for further decontamination, if necessary.

Test atmosphere for MDI. Neutralize small spills with decontaminant. Remove and properly dispose of residues. (See Section 13 for disposal considerations.) Notify applicable government authorities if release is reportable. The CERCLA RQ for 4,4-MDI is 5,000 lbs (see CERCLA in Section 15)..

## 7. HANDLING AND STORAGE

Storage Temperature: minimum: -34 °C (-29.2°F)

maximum: 50°C (122 °F)

Storage Period 6 Months @ 3.89 °C (25 °F) after receipt of material by customer

### Handling/Storage Precautions

#### Handling

Avoid personal contact with the product or reaction mixture. Use only with adequate ventilation to ensure that the occupational exposure limit is not exceeded. The efficiency of the ventilation system must be monitored regularly because of the possibility of blockage. Avoid breathing aerosols, mists and vapors. (See Section 8 – Exposure Control for details.) Keep stocks of decontaminant readily available.

#### Storage

Keep containers properly sealed and when stored indoors, in a well ventilated area. Keep contents away from moisture. Due to reaction with water, producing CO<sub>2</sub> gas, a hazardous buildup of pressure could result if contaminated containers are re-sealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in containers made of copper, copper alloys or galvanized surfaces.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Diphenylmethane 4, 4' - diisocyanate

Exposure Limits: ACGIH TLV (United States, 1/2006)

TWA: 0.051 mg/m<sub>3</sub> 8 hour/hours

TWA: 0.005 ppm 8 hour/hours

NIOSH REL (United States, 12/2001)

CEIL: 0.2 mg/m<sub>3</sub> 10 minute/minutes

CEIL: 0.02 ppm 10 minute/minutes

TWA: 0.05 mg/m<sub>3</sub> 10 hour/hours

TWA: 0.005 ppm 10 hour/hours

OSHA PEL (United States, 8/1997)

CEIL: 0.2 mg/m<sub>3</sub>

CEIL: 0.02 ppm

OSHA PEL 1989 (United States, 3/1989)

CEIL: 0.2 mg/m<sub>3</sub>

CEIL: 0.02 ppm

### Preventive Measures

Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at the workplace. Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Persons with respiratory problems, including asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or skin allergies should be evaluated for their suitability of working with this product. Once a person is diagnosed as sensitized, no further exposure to the material that caused the sensitization should be permitted.

### Engineering Controls

Use local exhaust ventilation to maintain airborne concentrations below the TLV. Suitable respiratory equipment should be used in cases of insufficient ventilation or where operational procedures demand it.

### Personal Protection –

#### Respiratory Protection

When the product is sprayed or heated without adequate ventilation, an approved MSHA/NIOSH positive-pressure, supplied-air respirator may be required. Air purifying respirators equipped with organic vapor cartridges and a HEPA (P100) particulate filter may be used under certain conditions when a cartridge change-out schedule has been developed in accordance with the OSHA respiratory protection standard (29 C.F.R. 1910.134).

#### Eye Protection

Chemical safety goggles. If there is a potential for splashing, use a full-face shield.

#### Hand Protection

Chemical resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Gloves made of neoprene, nitrile rubber, or butyl rubber materials are recommended. This latex disposable gloves should be avoided for repeated or long term use.

#### Skin and body protection

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact. Gloves, long-sleeved shirts and pants.

#### Medical Surveillance

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no

further exposure can be permitted.

#### **Additional Protective Measures**

Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

### **9. PHYSICAL AND CHEMICAL PROPERTIES**

Physical State: Liquid  
Color: Not available  
Odor: Slightly musty  
Odor Threshold: Not available  
pH: Not applicable  
Specific Gravity (H<sub>2</sub>O=1): 1.23 – 1.25  
Boiling Point: >300 °C Decomposes  
Melting Point: Not available  
Flash Point: Closed cup: 203 °C (397.4 °F)  
Explosive Properties: Not explosive  
Oxidizing Properties: Not available  
Vapor Pressure: 0.000004 mmHg  
Vapor Density: 8.5  
Auto-Ignition Temperature: >600

### **10. STABILITY AND REACTIVITY**

#### Stability

Stable at room temperature under recommended handling and storage conditions.

#### Reactivity

Avoid temperatures above 105 °F. Product can react with itself at temperatures above 320 °F.

Product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid moisture.

Reaction with water (moisture) produces CO<sub>2</sub> gas which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

#### Incompatibility / Materials to Avoid

Avoid contact with acids, bases, strong oxidizing materials, alcohols, ammonia, water and/or moist air. Avoid contact with most organic absorbents. Avoid water as it reacts to form heat and carbon dioxide. Generation of gas can cause pressure buildup in closed systems. Avoid amines, aluminum, galvanized metals, tin, zinc, copper or brass. Avoid unintended contact with polyol. The reaction of polyols and isocyanates generate heat. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact. These reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and are denser than water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea.

#### Hazardous Polymerization

Polymerization can occur. It can be catalyzed by strong bases and water. Diisocyanate can react with itself at temperatures above 320 °F.

#### Hazardous decomposition products

During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include, but are not limited to: nitrogen oxides (NO, NO<sub>2</sub>, ...), isocyanates, hydrogen cyanide, carbon monoxide and carbon dioxide.

Hazardous decomposition products depend upon temperature,

### **11. TOXICOLOGICAL INFORMATION**

#### **For Product/Ingredient: Diphenylmethane 4,4'-diisocyanate**

Acute Inhalation Toxicity: LC50 0.49 mg/l (4 hour/hours) Rat

LC50 490 mg/m<sup>3</sup> (1 hour/hours) Rat

LC50 >2240 mg/m<sup>3</sup> (1 hour/hours) Rat

Acute Oral Toxicity: LD50 > 5,000 mg/kg Rat

Acute Dermal Toxicity: LD50 > 5,000 mg/kg Rabbit

#### **For Product/Ingredient: Diphenylmethanediisocyanate, Isomers and Homologues**

Acute Inhalation Toxicity: LC50 0.49 mg/l (4 hour/hours) Rat

Acute Oral Toxicity: LD50 > 5,000 mg/kg Rat

Acute Dermal Toxicity: LD50 > 5,000 mg/kg Rabbit

### **Acute Toxicity –**

#### **Inhalation**

This product is a respiratory irritant and potential respiratory sensitizer. Repeated inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

#### **Ingestion**

Low oral toxicity. Ingestion may cause irritation of the gastrointestinal tract.

#### **Eyes**

Irritating to eyes.

#### **Skin**

Irritating to skin. May cause sensitization by skin contact. Animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

### **Potential Chronic Health Effects –**

#### **Carcinogenic Effects**

Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m<sup>3</sup>), was there a significant incidence of a benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). There were no lung tumors at 1 mg/m<sup>3</sup> and no effects at 0.2 mg/m<sup>3</sup>. Overall, the tumor incidence, both benign and malignant, and the number of animals with the tumors were not different from controls. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur.

#### **Mutagenic Effects**

There is no substantial evidence of mutagenic potential.

#### **Teratogenicity / Reproductive Toxicity**

No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations, which are well in excess of defined occupational exposure limits.

## **12. ECOLOGICAL INFORMATION**

### **For Product/Ingredient: Diphenylmethane 4,4'-diisocyanate**

LC50 >1000 mg/l 96 hour/hours Zebra Fish

EC50 >1000 mg/l 48 hour/hours Water Flea (Daphnia magna)

#### **Toxicity to Microorganisms**

EC50: > 1,000 mg/l, (Activated sludge microorganisms, 3 hrs)

## **13. DISPOSAL CONSIDERATIONS**

### **Waste Disposal Method**

Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method. Do not dump in sewers, ground or any body of water.

### **Empty Container Precautions**

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

## **14. TRANSPORT INFORMATION**

### **Land transport(DOT)**

**Proper Shipping Name:** Other regulated substances, liquid, n.o.s.  
(Hexamethylene-1,6-Diisocyanate)

**Hazard Class or Division:** 9  
**UN/NA Number:** NA3082  
**Packaging Group:** III  
**Hazard Label(s):** Class 9  
RSPA/DOT Regulated Components  
Hexamethylene-1,6-Diisocyanate  
**Reportable Quantity:** 33,333 lb  
**Sea transport (IMDG)**  
**Non-Regulated**  
**Air transport (ICAO/IATA)**  
**Non-Regulated**

**Additional Transportation Information**

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

**15. REGULATORY INFORMATION**

**United States Federal Regulations**

**OSHA Hazcom Standard Rating:** Hazardous

**US. Toxic Substances Control Act:** Listed on the TSCA Inventory.

**US. EPA CERCLA Hazardous Substances (40 CFR 302):**

**Components**

None

**SARA Section 311/312 Hazard Categories:**

Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302**

**Extremely Hazardous Substance (40 CFR 355, Appendix A):**

**Components**

None

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title HI Section 313 Toxic**

**Chemicals (40 CFR 372.65) - Supplier Notification Required:**

**Components**

None

**US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and**

**Appendix VIII Hazardous Constituents (40 CF R 261):**

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

**State Right-To-Know 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.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight % Components **CAS-No.**

>75 % Homopolymer of Hexamethylene 28182-81-2

Diisocyanate

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

**Weight % Components CAS-No.**

<=0.3% Hexamethylene-1,6-Diisocyanate 822-06-0

California Prop. 65:

To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm,

**16. OTHER INFORMATION**

**Date Revised: 05/06/2015**

**MANUFACTURER'S NAME AND ADDRESS:**

**Petra Polymers**

**1610 E. Miraloma Ave.**

**Placentia, CA 92870**

**Telephone: 714-572-6723**

The information herein is given in good faith, but no warranty expressed or implied is made. Petra Polymers urges users of this product to evaluate its suitability and compliance with local regulations as Petra Polymers cannot foresee the nature of the final application nor final location of usage.