Safety Data Sheet

PetraThane RCU – PART A

1. IDENTIFICATION

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

PRODUCT IDENTIFIER/NAME: **PetraThane RCU – PART A**
RECOMMENDED USE: Chemical intermediate for polyurethane

2. HAZARD(S) IDENTIFICATION

HAZARD CLASSIFICATION:

Acute Oral Toxicity Category 5
Acute Dermal Toxicity Category 5
Skin Irritation Category 2
Skin Sensitizer Category 1
Respiratory Sensitizer Category 1
TOST: Single Exposure Category 3

NFPA ratings (scale 0 – 4):

HEALTH	**2**
FIRE	**1**
REACTIVITY	**0**
SPECIAL	**-**

NFPA HAZARD RATING:
4= EXTREME 2= MODERATE 0= INSIGNIFICANT
3= HIGH 1= SLIGHT

HAZARD PICTOGRAMS:

SIGNAL WORD: Warning

PHYSICAL APPEARANCE: Milky clear or colored liquid with aromatic odor

HAZARD STATEMENTS:

WARNING!

May cause eye, skin, and respiratory tract irritation. Closed container *may* forcibly rupture under extreme heat. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Vapors

may travel to areas away from work site before igniting/flashing back to vapor source. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal. May cause kidney damage. May cause liver damage. May cause blood disorder.

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTES OF ENTRY: Skin Contact, Eye Contact, Ingestion, Inhalation

MEDICAL CONDITIONS AGGRAVATED BY: Skin disorders, Respiratory disorders, Eye disorders, Allergies

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

ACUTE INHALATION:
Amine –OH Polyol Ester: Inhalation is unlikely due to low vapor pressure. At elevated temperatures, may cause respiratory tract irritation with symptoms of coughing, sore throat and runny nose.

ACUTE SKIN:
Amine –OH Polyol Ester: May cause slight irritation.

ACUTE EYE:
Amine –OH Polyol Ester: Not expected to be irritating
ACUTE INGESTION
Amine –OH Polyol Ester: Ingestion is not a typical route of industrial exposure. Not expected to be harmful if swallowed,

Aliphatic Carboxylic Ester: May be harmful if swallowed.

Carcinogenicity: No Carcinogenic substances as defined by IARC, NTP and/or OSHA

PRECAUTIONARY STATEMETNS: 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

Amine –Polyol Ester	(CAS TS)	> 60%
Aliphatic Carboxylic Ester	(CAS TS)	1-5%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not Hazardous per this OSHA Standard may be listed. Where proprietary Ingredient shows, the identity may be made available as provided **i**n this standard**.**

4. FIRST AID MEASURES

EYES: 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. Call a physician immediately.
SKIN: In case of skin contact, wash affected areas with soap and water. Immediately remove contaminated clothing and shoes. Get medical attention if irritation develops.
INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
INGESTION: Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Do not give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: All extinguishing media are suitable; water spray for large fires.
SPECIAL FIRE FIGHTING PRECAUTIONS: Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize risk of rupture.
UNUSUAL FIRES PRECAUTIONS: Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Vapors or fumes may form explosive mixture with air. Dry residue will support combustion.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES: Cleanup personnel must use appropriate personal protective equipment. Evacuate and keep unnecessary people out of spill area. Ventilate area to remove vapors or dust. Dike or dam spilled material and control further spillage, if possible. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Wash spill area with water.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE:
Minimum: 0ºC (32ºF)
Maximum: 40ºC(104ºF)

STORAGE PERIOD: 6 months

HANDLING AND STORAGE PROCEDURE: Use only with adequate ventilation/personal protection- Wash thoroughly after handling. Keep container closed when not in use. Do not get in eyes. Do not get on skin or clothing_ Avoid breathing dust, vapor, or mist. Protect from freezing. Store in original or similar containers. Protect from light. May form explosive peroxides.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

INDUSTRIAL HYGIENE/VENTILATION MEASURES: General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination. Curing ovens must be ventilated to prevent the build up of explosive atmospheres and to prevent off gases from entering the work place.

RESPIRATORY PROTECTION: In case of insufficient ventilation wear suitable respiratory equipment., The following respirator is recommended if airborne concentrations exceed the appropriate standard/guideline., NIOSH approved, air purifying organic vapor respirator.

HAND PROTECTION: Permeation resistant gloves.

EYE PROTECTION: Chemical resistant goggles must be worn, Chemical safety goggles in combination with a full face shield if a splash hazard exists.

SKIN AND BODY PROTECTION: Wear cloth work clothing including long pants and long-sleeved shirts.

ADDITIONAL PROTECTIVE MEASURES: Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations should be available.

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Liquid
APPEARANCE: Thixotropic
COLOR: Clear light yellow or Pigmented
ODOR: Slight
pH: Not established
BOILING POINT: Approximately 185 °C (365 °F)
FLASH POINT: > 145 °C (> 293 °F)

VAPOR PRESSURE: Approximately 20 mbar @ 55 °C (131 °F)
Approximately 17 mbar @ 50 °C (122°F)
DENSITY: Approximately 8 mbar @ 20 °C (68 ˚F)
SOLUBLE IN WATER: Insoluble
AUTO-IGNITION TEMPERATURE: Approximately 365 °C (707 °F)
VISCOSITY: Approximately 1,450mPa.s @ 25 °C (77 °F)

10. STABILITY AND REACTIVITY

STABILITY: Stable
MATERIALS TO AVOID: Oxidizing agents, reducing agents, Acids, Bases
CONDITIONS TO AVOID: Avoid heat, open flame, and prolonged storage at elevated temperatures, Protect from freezing
HAZARDOUS DECOMPOSITION PRODUCT: By Fire and Thermal Decomposition: carbon dioxide and carbon monoxide, chlorine compounds, fluoride compounds, various hydrocarbons, nitrogen oxides (NOx), other aliphatic fragments which have not been determined.
HAZARDOUS REACTIONS: Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

		Toxicity Level
Acute Oral Toxicity	Amine –OH Polyol Ester	LD50: > 2,000 mg/kg (Rat)

Amine –OH Polyol Ester, Eye Irritation rabbit, Draize, Exposure Time: 24 hrs, Slightly irritating
Mutagenicity
AMES: Negative results were reported in various in vitro studies. (Salmonella typhimurium, Metabolic Activation; with/without).

12. ECOLOGICAL INFORMATION

Amine –OH Polyol Ester

BIODEGRATION: 13 %, Exposure time:28 d, Not readily biodegradable
ACUTE AND PROLONG TOXICITY TO FISH: LC50: 66 mg/l (Zebra fish (Brachydanio rerio))
TOXICITY TO MICROORGANISMS: ECI0: 3,110 mg/l, (Activated sludge microorganisms, 24 h)

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Waste disposal should be in accordance with existing federal, state and local environmental control laws.
EMPTY CONTAINER PRECAUTION: Recondition or dispose of empty container in accordance with governmental regulations. Empty containers retain product residue (dust, liquid, vapor and/or gases) and can be dangerous. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed.

14. TRANSPORT INFORMATION

Transportation Emergency Number: 1-800-255-3924 CHEM-TEL.

Land transport: (DOT) NOT REGULATED

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA HAZCOM STANDARD RATING: None

US TOXIC SUBSTANCE CONTROL ACT: Listed on the TSCA Inventory.

SARA SECTION 3111312 HAZARD CATEGORIES: Acute Health Hazard

SUPERFUND AMENDMENTS and REAUTHORIZATION ACT of 1986 (SARA) TITLE III
Section 302: Extremely Hazardous Substance (40 CFR 355,)

U.S. EPA EMERGENCY PLANNING AND COMMUNITY ACT (EPCRA) SARA TITLE III
Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

U.S. EPA RESOURCE AND CONSERVATION ACT (RCRA) COMPOSITE LIST OF HAZARDOUS WASTES AND APPENDIX VIII HAZARDOUS CONSTITUENTS (40 CFR 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.

MASSSACHUSETT, NEW JERSEY, AND PENNSYLVANIA RIGHT TO KNOW ACT:

Weight %	Components	**CAS-No.**
>60 %	Amine –Polyol ester	TS
1-5 %	Aliphatic Carboxylic Ester	TS

Chemical Name	CAS Number	% By Weight	RQ
NONE			

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: 888-497-3872

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 or final location of usage.

Safety Data Sheet

PetraThane RCU – PART B

1. IDENTIFICATION

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

PRODUCT IDENTIFIER/NAME: **PetraThane RCU – 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 Irritation Category 3
Eye Irritation Category 2
Skin Sensitizer Category 1
Respiratory Sensitizer Category 1
TOST: Single Exposure Category 2
TOST: Repeated Exposure Category 2

NFPA ratings (scale 0 – 4):

HEALTH	**2**
FIRE	**1**
REACTIVITY	**1**
SPECIAL	**-**

NFPA HAZARD RATING:
4= EXTREME 2= MODERATE 0= INSIGNIFICANT
3= HIGH 1= SLIGHT

HAZARD PICTOGRAMS:

SIGNAL WORD: Warning

PHYSICAL APPEARANCE: Milky clear liquid with slight odor

HAZARD STATEMENTS:

WARNING!
May cause eye, skin, and respiratory tract irritation. Closed container *may* forcibly rupture under extreme heat. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal. May cause kidney damage. May cause liver damage. May cause blood disorder.

POTENTIAL HEALTH EFFECT

PRIMARY ROUTES OF ENTRY: Skin Contact, Eye Contact, Ingestion, Inhalation
MEDICAL CONDITIONS AGGRAVATED BY: Skin disorders, Respiratory disorders, Eye disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

ACUTE INHALATION
Aliphatic Polyisocyanate: Diisocyanate or polyisocyanate vapors or mist at concentrations above the exposure limits or guidelines can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) with symptoms of runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing difficulty). Persons with a preexisting, nonspecific bronchial hyper reactivity can respond to concentrations below the exposure limits or guidelines with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the exposure limits or guidelines may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g. fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

CHRONIC INHALATION:
Aliphatic Polyisocyanate: As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates or polyisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates or polyisocyanates at levels well below the exposure limits or guidelines. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. 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. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

ACUTE SKIN:
Aliphatic Polyisocyanate: Causes irritation with symptoms of reddening, itching, and swelling. Can cause sensitization. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

CHRONIC SKIN:
Aliphatic Polyisocyanate: Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

ACUTE EYE:
Aliphatic Polyisocyanate: Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor may cause irritation with symptoms of burning and tearing.

CHRONIC EYE:
Aliphatic Polyisocyanate: Prolonged vapor contact may cause conjunctivitis.

ACUTE INGESTION:
Aliphatic Polyisocyanate: May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Carcinogenicity: No Carcinogenic substances as defined by IARC, NTP and/or OSHA

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

Homopolymer of Hexamethylene Diisocyanate	(CAS 28182-81-2)	>60 %
Hexamethylene-1,6-Diisocyanate	(CAS 822-06-0)	< 0.3%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not Hazardous per this OSHA Standard may be listed. Where proprietary Ingredient shows, the identity may be made available as provided **i**n this standard**.**

4. FIRST AID MEASURES

EYES: 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. Call a physician immediately.
SKIN: In case of skin contact, wash affected areas with soap and water. Immediately remove contaminated clothing and shoes. Get medical attention if irritation develops.
INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration, If breathing is difficult, give oxygen. Get medical attention.
INGESTION: Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Do not give anything by mouth to an unconscious person. Get medical attention.
NOTES TO PHSYCIAN: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic / steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a 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 the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Dry chemical, carbon dioxide (CO2), water spray for large fires,
SPECIAL FIRE FIGHTING PRECAUTIONS: Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize risk of rupture.
UNUSUAL FIRES PRECAUTIONS: Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (C02 formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PRECAUTIONS: Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil. Call Bayer at 412-923-1800 for assistance and advice. Major Spill or Leak (Standing liquid): To minimize vapor, cover the spillage with fire fighting foam (AFFF). Released material may be pumped into closed, but not sealed, metal container for disposal. Process can generate heat. Minor Spill or Leak (Wet surface): Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri®, etc). Saturate absorbent material with neutralization solution and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent until

the surface is decontaminated. Check for residual surface contamination. Swype® test kits have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (C02) escape.

NEUTRALIZATION SOLUTIONS:

(1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
(2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% npropanol.
(3) A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10). (4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Petra Polymers requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE:

Minimum: -34 °C (-29.2 °F)
Maximum: 50°C (122 °F) Storage Period
STORAGE PERIOD: 6 Months at 3.89 °C (25 °F):

HANDLING AND STORAGE PROCEDURE: Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent 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. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear Appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

FURTHER INFO FOR STORAGE: Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard. 29 CFR 1910.1200.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits

Homopolymer of Hexamethylene Diisocyanate	Time Weighted Average (TWA)	0.5 mg/m3
	Short Term Exposure Limit (STEL)	1.0 mg/m3 (15-min)
Hexamethylene-1,6-Diisocyanate	Time Weighted Average (TWA)	0.005 ppm
	Ceiling Limit Value	0.02 ppm

INDUSTRIAL/HYGIENE VENTIALTION MEASURES: Good industrial hygiene practice dictates that worker protection should be achieved through engineering controls, such as ventilation, whenever feasible. When such controls are not feasible to achieve full protection, the use of respirators and other personal protective equipment is mandated. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination. Curing ovens must be ventilated to prevent emissions into the workplace. If oven off-gases are not vented properly (i.e. they are released into the work area), it is possible to be exposed to airborne monomeric HDI.
RESPIRATORY PROCEDURE: A respirator that is recommended or approved for use in isocyanate-containing environments (air-purifying or fresh air-supplied) may be necessary for spray applications or other situations such as high temperature use which may produce inhalation exposures. A supplied-air respirator (either positive pressure or continuous flow-type) is recommended. Before an air-purifying respirator can be used, air monitoring must be performed to measure airborne concentrations of HDI monomer. and HDI polyisocyanate. Specific conditions under which air-purifying respirators can be used

are outlined in the following sections. Observe OSHA regulations for respirator use (29 CFR 1910.134). SPRAY APPLICATION: A. Good industrial hygiene practice dictates that when isocyanate-based coatings are spray applied, some form of respiratory protection should be worn. During the spray application of coatings containing this product the use of a supplied-air (either positive pressure or continuous flow-type) respirator is mandatory when ONE OR MORE of the following conditions exists: -the airborne isocyanate concentrations are not known; or -the airborne isocyanate monomer concentrations exceed 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); or -the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed 5 mg/m3 averaged over 8 hours or 10 mg/m3 averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits); or -operations are performed in a confined space (See OSHA Confined Space Standard, 29 CFR 1910.146). A properly fitted air-purifying (combination organic vapor and particulate) respirator, proven by test to be effective in isocyanate-containing spray paint environments, and used in accordance with all recommendations made by the manufacturer, can be used when ALL of the following conditions are met: -The airborne isocyanate monomer concentrations are known to be below 0.05 ppm averaged over eight (8) hours (10 times 8 hour TWA exposure limit); and -the airborne polyisocyanate (polymeric, oligomeric) concentrations are known to be below 5 mg/m3 averaged over 8 hours or 10 mg/m3 averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits) and - a NIOSH-certified End of Service Life Indicator or a change schedule based upon objective information or data is used to ensure that cartridges are replaced before the end of their service life. In addition, prefilters should be changed whenever breathing resistance increases due to particulate buildup. NON-SPRAY OPERATIONS: A. During non-spray operations such as mixing, batch-making, brush or roller application, etc., at elevated temperatures (for example, heating of material or application to a hot substrate), it is possible to be exposed to airborne isocyanate vapors. Therefore, when the coatings system will be applied in a non-spray manner, a supplied-air (either positive pressure or continuous flow-type) respirator is mandatory when ONE OR MORE of the following conditions exists: the airborne isocyanate concentrations are not known; or - the airborne isocyanate monomer concentrations exceed 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); or - the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed 5 mg/m3 averaged over 8 hours or 10 mg/m3 averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits); or ; operations are performed in a confined space (See OSHA Confined Space Standard, 29 CPR 1910.146). A properly fitted air-purifying (combination organic vapor and particulate) respirator, proven by test to be effective in isocyanate-containing paint environments, and used in accordance with all recommendations made by the manufacturer, can be used when ALL of the following conditions are met: -the airborne concentrations of the isocyanate monomer are below 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); and - the airborne polyisocyanate (polymeric, oligomeric) concentrations are known to be below 5 mg/m3 averaged over eight (8) hours or 10 mg/m3 averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits) and - a NIOSH-certified End of Service Life Indicator or a change schedule based upon objective information or data is used to ensure that cartridges are replaced before the end of their service life. In addition, prefilters should be changed whenever breathing resistance increases due to particulate buildup.

HAND PROTECTION: Gloves should be worn. Nitrile rubber gloves., Butyl rubber gloves., Neoprene gloves

EYE PROTECTION: When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

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 SURVIELLANCE: 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. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

ADDITONAL SAFETY 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

FORM: Liquid

COLOR: Colorless to light yellow
ODOR: Slight
pH: Not established
BOILING POINT: Not Applicable, Decomposition
FLASH POINT: > 193 °C (> 379.4 °F)
VAPOR PRESSURE: HDI Polyisocyanate: 5.2 X 10-9 @ 20 °C (68 °F) mmHg
DENSITY: 1.15 @ 20 °C (68 ˚F)
SOLUBLE IN WATER: Insoluble – Reacts slowly with water to liberate CO2 gas
AUTO-IGNITION TEMPERATURE: Approximately 435 °C (815 °F)
VISCOSITY DYNAMIC:: Approximately 726 mPa.s @ 23 °C (73.4 °F)

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions of use and storage.
MATERIALS TO AVOID: Water, Amines, Strong bases, Alcohols, copper alloys.
CONDITIONS TO AVOID: None known
HAZARDOUS DECOMOSITION PRODUCTS: By Fire and Thermal Decomposition: Carbon oxides, nitrogen oxides (NOx), hydrogen cyanide, Isocyanic acid, other aliphatic fragments which have not been determined.
HAZARDOUS REACTIONS: Contact with moisture, other materials that react with isocyanates, or temperatures above 350 °F (177 C), may cause polymerization.

11. TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY: LD50: > 5,000 mg/kg (Rat)
ACUTE INHALATION TOXICITY: LC50: 390-453 mg/m3, aerosol, 4 hr (Rat, Male/Female)
RD50: 20.8 mg/m3, 3 hrs.
ACUTE DERMAL TOXICITY: LD50: > 5,000 mg/kg (rabbit)
SKIN IRRATATION: Rabbit, Draize, Slightly irritating
EYE IRRATATION: Rabbit, Draize, Slightly irritating
SENSITIZATION:
Dermal: Sensitizer (guinea pig, Maximisation Test (GPMT))
Dermal: Non-sensitizer (Guinea pig, Buehler)
Inhalation: Non-sensitizer (guinea pig)

REPEATED DOSE TOXICITY:
3 wks, inhalation: NOAEL: 3.7 - 4.3 mg/m3, (Rat)
90 ds, inhalation: NOAEL: 3:3 3.4 mg/m3, (Rat)
Irritation to lungs and nasal cavity.

MUTAGENICITY:
Ames: Negative (Salmonella typhimurium, Metabolic Activation: with/without)

12. ECOLOGICAL INFORMATION

ECOLOGICAL DATA FOR HOMOPOLYMER OF HEXAMETHLENE DEXAMETHYLENE DIISOCYANATE BIODEGRATION: 0 %, Exposure time: 28 Days, Not readily biodegradable.
ACUTE AND PROLONGED GOXICITY TO FISH: LCD: > 100 mg/l (Zebra fish (Brachydanio rerio)
ACUTETOXICITY TO AQUATIC INVERTEGRATES: EC0: > 100 mg/l (Water flea (Daphnia magna)
TOXICITY TO AQUATIC PLANTS: EC50: > 1,000 mg/l, (Green algae (Scenedesmus subspicatus)
TOXICITY TO MICROORGANISMS: EC50: > 1,000 mg/l, (Activated sludge microorganisms)

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.
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

Transportation Emergency Number: 1-800-255-3924 CHEM-TEL.

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 QUANTITIES: 33,333 lb
SEA IMPORTED (IMDG)
Non-Regulated
AIR TRANSPORT (ICAO/IATA)
Non-Regulated
ADDITIONAL TRANSPORTATION METHODS: When in individual containers of less than the Product RQ, this material ships as non-regulated.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

OSHA HAZCOM STANDARD RATING: Hazardous

U.S. TOXIC SUBSTANCE CONTROL ACT: Listed on the TSCA Inventory.

US. EPA RESOURCE AND CONSERVATION ACT (RCRA) COMPOSITE LIST OF HAZARDOUS WASTES AND APPENDIX VIII HAZARDOUS CONSTITUENTS (40 CFR 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.

MASSSACHUSETT, NEW JERSEY, AND PENNSYLVANIA RIGHT TO KNOW ACT:

Weight %	Components	**CAS-No.**
>75 %	Homopolymer of Hexamethylene Diisocyanate	28182-81-2

NEW JERSEY ENVIROMENTAL HAZARDOUS SUBSTANCES LIST AND/OR NEW JERSEY RTK SPECIAL HAZARDOUS SUBSTANCE 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: 888-497-3872

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 or final location of usage.