Safety Data Sheet

PetraThane CRU-G – 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 CRU-G – PART A**
RECOMMENDED USE: Chemical intermediate for polyurethane

2. HAZARD(S) IDENTIFICATION

HAZARD CLASSIFICATION:

Acute Oral Toxicity Category 4
Acute Dermal Toxicity Category 5
Acute Vapors Toxicity Category 5
Skin 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	**3**
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 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 CONDITINOS AGGRAVATED BY: Skin disorders, Eczrma, Asthma, Respiratory disorders, Eye disorders, Allergies.

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

INHALATION:
Methyl Acetate & Benzene, 1-chloro-4-(trifluoromethyl): May produce symptoms of central nervous system depression including headache, dizziness, nausea, loss of balance and drowsiness.
Amine –OH Polyol Ester: Inhalation is unlikely due to low vapor pressure. At eleated temperatures,may cause respiratory tract irritation with symptoms of coughing, sore throat and runny nose.

SKIN:
Amine –OH Polyol Ester, Methyl Acetate & Benzene, 1-chloro-4-(trifluoromethyl): May cause slight irritation.

EYE:
Methyl Acetate & Benzene, 1-chloro-4-(trifluoromethyl): May be irritating.
Acute Eye
Amine –OH Polyol Ester: Not expected to be irritating

CHRONIC INGESTION:
Methyl Acetate & Benzene, 1-chloro-4-(trifluoromethyl): Ingestion may cause damage to the lining of the gastrointestinal tract.

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 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. Keep away from open flames and hot surfaces. 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)	< 70%
Aliphatic Carboxylic Ester	(CAS TS)	1-4%
Benzene, 1-chloro-4-(trifluoromethyl)	(CAS 98-56-6)	<15%
Methyl Acetate	(CAS 79-20-9))	<15%

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 in this standard.

4. FIRST AID MEASURES

EYE: 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. If easy to do, remove contact lenses. 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 breathing is difficult, have trained person administer oxygen. If not breathing, give artificial respiration, Get medical attention immediately.
INGESTION: Call physician or poison control center immediately. Do not induce vomiting unless instructed to by medical personnel. Get immediate medical attention. Do not give anything by mouth to an unconscious person.
NOTES TO PHYSICIANS: Administration of adsorbents such as activated charcoal may be of value. Gastric lavage may be effective when performed by a physician within 4 hours of ingestion.

5. FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: All extinguishing media are suitable; water spray for large fires,
SPECIAL FIRE FIGHTING PROCEDURES: 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. USE WATER WITH CAUTION. Water may be ineffective in fighting the fire. Over-heated drums may rupture. Heavy vapors can travel to source of ignition and flash back.
UNUSUAL FIRE 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: Evacuate unnecessary personnel and eliminate all sources of ignition. 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: 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. Keep away from heat, sparks, pilot lights, welding operations and open flame. Do not eat, drink or smoke in areas where this material is used. Ground all equipment. Never enter a pit or tank without following safety procedures-never alone, always with a lifeline and positive pressure supplied air. Vapors are heavier than air and will tend to collect in low areas.
Avoid use in confined spaces. Areas of poor ventilation could contain concentrations high enough to cause unconsciousness and death. Use approved supplied air respirator following manufacturer's recommendations where vapors may be generated.
Do not reuse containers.

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 buildup 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., use NIOSH/MSHA approved positive pressure self-contained breathing apparatus..
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: Aromatic
pH: Not established
BOILING POINT: Approximately 58 °C
FLASH POINT: > 145 °C (> 293 °F)
VAPOR PRESSURE: Approximately 180 mm Hg @ 20 °C
VAPOR DENSITY: 4.4
DENSITY: 1.08
SOLUBILITY IN WATER: Insoluble
AUTO-IGNIGTION TEMPERATURE: Approximately 365 °C

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 PRODUCTS: 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.

11. TOXICOLOGICAL INFORMATION

Toxicity Levels

Acute Oral Toxicity	*Amine –OH Polyol Ester*	LD50: > 2,000 mg/kg (Rat)
	Methyl Acetate	LD50: > 5,000 mg/kg (Rat)
	Benzene, 1-chloro-4-(trifluoromethyl)	LD50: > 6.8 g/kg (Rat)

Acute Dermal Toxicity	*Methyl Acetate*	LD50: > 5,000 mg/kg (Rabbit)
	Benzene, 1-chloro-4-(trifluoromethyl)	LD50: > 2.7 g/kg (Rabbit)

Acute Oral Toxicity	*Methyl Acetate*	LD50: > 5,000 mg/kg (Rat)
	Benzene, 1-chloro-4-(trifluoromethyl)	LD50: > 6.8 g/kg (Rat)

Acute Inhalation Toxicity	*Methyl Acetate*	LC50:4 hr > 16,000 ppm (Rat)
	Benzene, 1-chloro-4-(trifluoromethyl)	LC50: = 4479 ppm (Rat)

Amine –OH Polyol Ester: Eye Irritation rabbit, Draize, Exposure Time: 24 hrs, Slightly irritating

MUTAGENITY:

Ames: Negative results were reported in various in vitro studies. (Salmonella typhimurium, Metabolic Activation; with/without)
Methyl Acetate: Eye Irritation rabbit, non-irritating
Benzene, 1-chloro-4-(trifluoromethyl): Eye Irritation rabbit, modeerate

12. ECOLOGICAL INFORMATION

Amine –OH Polyol Ester

Biodegradation: 13 %, Exposure time:28 d, Not readily biodegradable

ACUTE AND PROLONGED TOXICITY TO FISH: LC50: 66 mg/l (Zebra fish (Brachydanio rerio), 96 hrs)

TOXICITY TO MICROORGANISMS: ECI0: 3,110 mg/l, (Activated sludge microorganisms, 24 h)

Benzene, 1-chloro-4-(trifluoromethyl)

Oxygen Demand Data: BOD-5: 393 mg/L
Acute Aquatic Effects Data: 96 h LC-50(fathead minnow) 320-399 mg/l
48 h EC-50 (daphnid) NOEC :
72 h (Selenastrum capricomutum

Methyl Acetate

AQUATIC ECOTOX DATA

Fish: LC50 (96 hr.) (Rainbow trout) 13.5 mg/L
LC50 (96 hr.) (Bluegill sunfish) 12.0 mg/L
MATC (31 day) (Fathead minnow) >0.54 <1.4 mg/L*
*Triethylene glycol used as solvent carrier
BCF (48 hr.) (Bluegill sunfish) 121.8 & 202.0
Invertebrates: LC50 (48 hr.) (Water flea) 12.4 mg/L
MATC (21 day) (Water flea) >0.03 < 0.05 mg/L*
*Acetone used as solvent carrier

Plants: LC50 (72 hr.) (Green & Blue-green algae) 500 mg/L

ENVIRONMENTAL FATE DATA

Biodegradation: Inconclusive due to volatility
Atmospheric lifetime: Estimated to be 65.9 days for OH radical reaction

P-CHOLORBENZOTRIFLUORIDE (PCBTF): Will preferentially partition to the atmosphere, due to its high volatility. It has been estimated that 99.93.of a 100 Kg spill would end up in the atmosphere, while only 0.06% would partition to water (M. Garlanda, 1990). The aqueous solubility of PCBTF (29.1 mg/L) would also tend to limit its potential impact to exposed aquatic systems. PCBTF has exhibited significant toxicity to aquatic species under laboratory conditions, but is unlikely to exhibit a similar degree of acute toxicity under environmental conditions due to the aforementioned solubility and volatility issues. The moderate level of bioaccumulation measured in laboratory tests will also be subject to environmental mitigation due to PCBTF's physical/chemical properties. PCBTF should rapidly volatilize from dry and moist soils. Volatility, and relative environmental partitioning characteristics, makes it unlikely that PCBTF represents a significant threat to aquatic or terrestrial environments.

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. Residual vapors may explode on ignition, do not heat, cut, grind, weld or drill on or near this container.

14. TRANSPORT INFORMATION

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

Shipping descriptions may vary based on mode of transport, quantities, package size and/or origin and destination. Consult your company's Hazardous Materials /Dangerous Goods Expert for information specific to your situation.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA HAZCOM STANDARD RATING: None

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

U.S. EPA CERCLA HAZARDOUS SUBSTANCES (40 CELT 302) SARA SECTION 3111312 HAZARD CATEGORIES: Fire Hazard, Acute Health Hazard,

U.S. EPA EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA) SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE (40 CFR 355, APPENDIX A): None

U.S. EPA EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA) SARA TITLE III SECTION 313 TOXIC CHEMICALS (40 CFR 372.65)- SUPPLIER NOTIFICATION REQUIRED: None

U.S. EPA RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) COMPOSITE LIST OF HAZARDOUS WASTES AND APPENDIX VIII HAZARDOUS CONSTITUENTS (40 CFR 2610: 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

NEW JERSEY ENVIROMENTAL HAZARDOUS SUBSTANCES LIST AND/OR NEW JERSEY RTK SPECIAL HAZARDOUS SUBSTANCE LISTS:

Chemical Name CAS Number % By Weight
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: 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 or final location of usage.

Safety Data Sheet

PetraThane CRU-G – 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 CRU-G – 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 EFFECTS:

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

MEDICAL CONDITINOS AGGRAVATED BY: Skin disorders, Eczrma, Asthma, Respiratory disorders, Eye disorders. Allergies.

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 cause 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 hyperactivity 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

EYE: 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 PHYSICIAN: 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 EXTINGUISHING PROCEDURE: 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 FIRE PROCEDURE: 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 PROCEDURE: 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-Dry®, 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 @..3.89 °C (25 °F): after receipt of material by customer

HANDLING/STORAGE PRECAUTIONS: 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.

STORAGE CONDITIONS: 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/VENTILATION MEASURE: 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 PROTECTION: 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: 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 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.
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

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)
SOLUBILITY IN WATER: Insoluble – Reacts slowly with water to liberate CO2 gas
AUTO-IGNITION TEMPERATURE: Approximately 435 °C (815 °F)
VISCOSITY: Approximately 726 mPa.s @ 23 °C (73.4 °F)

10. STABILITY AND REACTIVITY

STABLE: Stable under normal conditions of use and storage.
MATERIALS TO AVOID: Water, Amines, Strong bases, Alcohols, copper alloys.
HAZARDOUS DECOMPOSITION PRODUCTS: By Fire and Thermal Decomposition: Carbon oxides, nitrogen oxides (NOx), hydrogen cyanide, Isocyanic acid, other aliphatic fragments which have not been determined.
HAZARDOUS REACTION: 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 IRRITATION: Rabbit, Draize, Slightly irritating
EYE IRRATION: 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.

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

12. ECOLOGICAL INFORMATION

ECOLOGICAL DATA FOR HOMOPOLYMER OF HEXAMETHLENE DIISOCYANATE
BIODEGRATION: 0 %, Exposure time: 28 Days, Not readily biodegradable.

ACUTE AND PROLONG TOXICITY TO FISH: LCD: > 100 mg/l (Zebra fish (Brachydanio rerio), 96 hrs)

ACUTE AND PROLONG TOXICITY TO INVERTEBRATES: EC0: > 100 mg/l (Water flea (Daphnia magna), 48 hrs)

TOXICITY TO PLANTS: EC50: > 1,000 mg/l, (Green algae (Scenedesmus subspicatus), 72 hrs)

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

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: 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 Hexamethylene-1,6-Diisocyanate

Reportable Quantity: 33,333 lb

ADDITIONAL TRANSPORTATION INFORMATION: 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.

U.S. EPA CERCLA HAZARDOUS SUBSTANCES (40 CELT 302) SARA SECTION 3111312 HAZARD CATEGORIES: Fire Hazard, Acute Health Hazard,

U.S. EPA EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA) SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE (40 CFR 355, APPENDIX A): None

U.S. EPA EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA) SARA TITLE III SECTION 313 TOXIC CHEMICALS (40 CFR 372.65)- SUPPLIER NOTIFICATION REQUIRED: None

U.S. EPA RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) COMPOSITE LIST OF HAZARDOUS WASTES AND APPENDIX VIII HAZARDOUS CONSTITUENTS (40 CFR 2610: 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: 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 or final location of usage.