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Material Safety Data Sheet

GRANICRETE POLY UA-73 (PART A)

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
PERS: (800) 633-8253	GRANICRETE INTERNATIONAL
HEALTH HAZARD 2 FIRE 1 REACTIVITY 1 SPECIAL 0	3420 S. 7 TH STREET SUITE 6 PHOENIX, AZ 85040 TELEPHONE: (602) 438-9464 PERS: (800) 633-8253

*For acute and chronic health effects refer to the discussion in Section III

SECTION I: NAME

PRODUCT NAME: POLY UA-73 (PART A)
CHEMICAL NAME: Hexamethylene Diisocyanate Based Polyisocyanate
SYNONYMS: Polymeric Hexamethylene Diisocyanate
CHEMICAL FAMILY: Aliphatic Polyisocyanate
TYPE OF USE: Coatings

HAZARDOUS INGREDIENTS	CAS #	%
Homopolymer of Hexamethylene Diisocyanate(HDI)	28182-81-2	100%

SECTION II: COMPOSITION/OCCUPATIONAL EXPOSURE LIMITS

HAZARDOUS INGREDIENTS	CAS #	%
Hexamethylene Diisocyanate(HDI)	28182-81-2	>50%
Time Weighted Average (TWA): 0.5 mg/m3		
Short Term Exposure Limit (STEL): 1.00 mg/m3 (15 minutes)		
Chlorobenzotrifluoride	98-56-6	<50%

SECTION III: HAZARD IDENTIFICATION

Emergency Overview: Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Causes eye irritation. May cause lung damage.

Signal Word: Warning

Hazards: May cause respiratory tract irritation; may cause allergic skin reaction; may cause skin irritation; may cause eye irritation; harmful if swallowed; may cause lung damage; closed container may explode under extreme heat or when contaminated with water; use cold water spray to cool fire-exposed

containers to minimize the risk of rupture; toxic gases/fumes are given off during burning or thermal decomposition.

Physical State: Liquid

Color: Colorless to light yellow

Odor: Slight

Potential Health Effects:

Routes of Exposure: Skin Contact, Inhalation, Eye Contact

Acute Skin: Causes irritation seen as local redness, itching and swelling. Repeated or prolonged skin contact may cause sensitization and an allergic skin reaction.

Chronic Skin: Prolonged contact can cause reddening, swelling, rash, and in some cases, skin sensitization.

Acute Inhalation: 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 hyperreactivity 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: As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitizations (chemical asthma) that will cause them to react to a later exposure to isocyanate at levels well below the TLV or MGL. These symptoms, which include: chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including decrease in lung function, which may be permanent. Sensitization may be either temporary or permanent.

Acute Eye Contact: 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 Contact: Prolonged vapor contact may cause conjunctivitis

Acute Ingestion: Ingestion can result in irritation. Symptoms may include abdominal

pain, nausea, vomiting and diarrhea.

Chronic Ingestion: None found

Carcinogenicity: This product is not listed by NIP, IARC, or regulated as a carcinogen by OSHA.
Medical Conditions Aggravated by Exposure: Asthma and other respiratory disorders (bronchitis, emphysema, hyper reactivity) skin allergies, eczema and existing eye conditions.

IV. FIRST AID MEASURES

Inhalation: If overcome by exposure, remove victim to fresh air immediately. Call a physician. Give oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Eye: Immediately flush eyes thoroughly with plenty of clean, lukewarm water and continue flushing for at least 15 minutes while lifting eyelids with fingers to ensure that the chemical is being flushed from the eyes. Refer individual to physician or ophthalmologist for immediate follow up.

Skin: Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Flush with lukewarm water for 15 minutes. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposure, seek medical attention if ill effect or irritation develops. Wash clothing before wearing again.

Ingestion: If ingested, give 1-2 cups of milk or lukewarm water (pint or ½ litre) if victim is fully conscious and alert. DO NOT INDUCE VOMITING. Obtain emergency medical attention.

Note to Physician: **Eyes:** Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation frequently. Workplace vapors could produce reversible corneal epithelial edema impairing vision.

Skin: This product is a known skin sensitizer. Treat symptomatically. There is no specific antidote.

Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the product.

Inhalation: This product is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material must be removed from any further exposure to any isocyanate.

SECTION V: FIRE-FIGHTING MEASURES

COMBUSTIBLE LIQUID

Flash Point: 115°F
Auto-Ignition Temperature >500°F

Lower Flammable Limit	9% Volume
Upper Flammable Limit	10.5% Volume

Extinguishing Media: Dry Chemical; Carbon Dioxide (CO₂) ; Foam; Water spray for large fires.
Special Fire Fighting Procedures: Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

Unusual Fire/Explosion Hazards: Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO₂) 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.

SECTION VI: ACCIDENTAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: Evaluate nonessential personnel. Remove sources of ignition. Notify appropriate authorities if necessary. Put on Protective equipment. Dike or impound spilled material and control further spillage if feasible. Ventilate. Prevent from entering ground water supply, sewers and soil. Cover the spilled material with sawdust, vermiculite, Fuller's earth or other absorbent material. Pour decontamination solution over spill area and allow to react for at least 10 minutes. Collect material in open containers and add further amounts of decontamination solution. Remove containers to a safe place, cover loosely, and allow to stand for 24 to 48 hours. Wash down spill area with decontamination solutions. Decontamination solutions: nonionic surfactant Union Carbide's Tergitol TMN-10 (20%) and water (80%); concentrated ammonia (3-8%), detergent (2%) and water (90-95%).

DISTRIBUTION EMERGENCIES: PERS should be notified at (800) 633-8253 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.

SECTION VII: HANDLING AND STORAGE

Storage Temperature (Min/Max): -34°C (-29°F)/122°F (50°C)

Shelf Life: 6 months at 77°F (25°C)

Storage Conditions: If container is exposed to high heat, it can be pressurized and possibly rupture explosively. HDI reacts slowly with water to form CO₂ gas. This gas can cause sealed containers to expand and possibly rupture explosively.

Handling Procedures: 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.

SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal Protection:

Ventilation: 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.

Respirator Requirements: 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 that may product 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 CR 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:

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 exist:

- 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 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
- operations are performed in a confined space (See OSHA confined Space Standard, 29 CFR 1910.146).

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- 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.

Monitoring: Refer to Patty's Industrial Hygiene and Toxicology-volume 1 (3rd edition) Chapter 17 and volume 3 (1st edition). Chapter 3 for guidance concerning appropriate air sampling strategy to determine airborne concentrations of isocyanate.

Medical Surveillance: Medical supervision of all employees who handle or come in contact with this isocyanate product is recommended. This should include pre-employment and periodic medical examinations with respiratory function tests (FEV, FVC, as a minimum.) Persons with asthma-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

Additional Protective Measures: Safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

Skin: Permeation resistant gloves (nitrile rubber, butyl rubber, PVA). Note Polyvinyl alcohol degrades in water. Based on laboratory assessment tests, it is recommended that latex gloves not be worn when working with isocyanates. Cover as much of the exposed skin area as possible with appropriate clothing (long sleeve shirts, trousers, etc.) If skin creams are used, keep the area protected only by the cream to a minimum.

Eye: Liquid chemical goggles. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment chemical goggles should be used in combination with a full face-shield.

Recommended Work Practices: Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

SPECIFIC GRAVITY	: Approximately 1.15 @ 20°C (68°F)
BOILING PRESSURE	: Not measurable due to decomposition
FLASH POINT	: 132.8°F (56°C)
pH	: NOT APPLICABLE
COLOR	: COLORLESS TO LIGHT YELLOW
STATE	: LIQUID
ODOR CHARACTERISTIC	: SLIGHT
VAPOR PRESSURE	: HDI Polyisocyanate: 4.7 x 10 ⁻⁷ mm Hg @ 20 C (68 F)
VISCOSITY	: Approx. 726 mPa.s @ 23°C/73.4°F-DIN EN ISO 3219/A.3
SOLUBILITY IN WATER	: Resin is insoluble – reacts slowly with water to liberate
CO ₂ gas.	
MELTING/FREEZING POINT	: No Data Available
DRY POINT	: No Data Available
MOLECULAR WEIGHT	: (Polyisocyanate) 500 g/mol
BULK DENSITY	: Approximately 9.6 lb/gal.

SECTION X: STABILITY AND REACTIVITY

Chemical Stability: This material is stable when properly handled and stored.

Hazardous Polymerization: May occur; Contact with moisture or other materials which react with isocyanates or temperatures above 400 F (204 C) may cause polymerization.

Incompatibility with: Water, Amines, strong bases, alcohols, copper alloys

Decomposition Products: By fire and thermal decomposition; carbon dioxide, carbon monoxide, oxides of nitrogen, HCN, HDI and other undetermined aliphatic fragments.

SECTION XI: TOXICOLOGICAL INFORMATION

TOXICITY DATA FOR: HDI homopolymer materials except where indicated.

ACUTE TOXICITY

ORAL LD50: Estimated to be greater than 5,000 mg/kg (rats). (Based on the results of actual tests conducted using specific HDI-homopolymer products)

DERMAL LD50: Estimated to be greater than 5000 mg/kg rabbits). (Based on the results of actual tests conducted using specific HDI-homopolymer products)

INHALATION LC50: LC50 values ranging from 390-453 mg/m³ were obtained in rats exposed to aerosols. (4-hour exposure)

EYE EFFECTS: rabbit, Draize, slightly irritating

SKIN EFFECTS: Slightly irritant; rabbit, Draize

SENSITIZATION: dermal: sensitizer (guinea pig, Maximisation Test (GPMT) dermal: non-sensitizer (guinea pig, Buehler) inhalation: non-sensitizer (guinea pig).

REPEATED DOSE TOXICITY: 3 weeks, inhalation: NOAEL: 3.7-4.3 mg/m³ (Rat)/ 90 days, inhalation: NOAEL: 3.3 – 3.4 mg/m³ (Rat)/ Irritation to lungs and nasal cavity.

SECTION XII: ECOLOGICAL INFORMATION

Biodegradation: 0%, Exposure time: 28 days, not readily biodegradable.

Acute and Prolonged Toxicity to Fish: LCO: >100 mg/l (Zebra fish (Brachydanio rerio), 96 hrs)

Acute Toxicity to Aquatic Invertebrates: ECO: >100 mg/l (Water flea (Daphnia magna), 48 hours)

Toxicity to Aquatic Plants: EC50: >1,000 mg/l, (Green algae (Scenedesmus subspicatus), 72 hours)

Toxicity to Microorganisms: EC50:> 1,000 mg/l, (Activated sludge microorganisms, 3 hours)

SECTION XIII: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Waste must be disposed of in accordance with federal, state and local environmental control regulations. Incineration is the preferred method. If incinerated, toxic and corrosive combustion gases must be properly handled.

EMPTY CONTAINER PRECAUTIONS: Empty containers retain product residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION XIV: TRANSPORT INFORMATION

DOT:

PROPER SHIPPING NAME:	NOT REGULATED
HAZARD CLASS OR DIVISION:	NOT REGULATED
UN/NA NUMBER:	NOT REGULATED
PACKING GROUP:	N/A
DOT PRODUCT RQ LBS. (KGS):	6250 LBS. (2834.0 KGS)
HAZARD LABEL:	NOT REGULATED
HAZARD PLACARD:	NOT REGULATED

Reportable Quantity: 33,333 lb.

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

IMO/IMDG CODE (OCEAN):

HAZARD CLASS DIVISION NUMBER: Non regulated

ICAO/IATA (AIR):

HAZARD CLASS DIVISION NUMBER: Non regulated

SECTION XV: REGULATORY INFORMATION

OSHA STATUS: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CR 1910.1200.

TSCA STATUS: On TSCA Inventory

CERCLA REPORTABLE QUANTITY: None

SARA TITLE III:

SECTION 302 EXTREMELY

HAZARDOUS SUBSTANCES: NONE

SECTION 311/312 HAZARD

CATEGORIES: Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

Reactive Hazard

SECTION 313 TOXIC CHEMICALS:
RCRA STATUS:

None

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 CFA 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

COMPONENT NAME/CAS NUMBER	CONCENTRATION	STATE CODE
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Homopolymer of Hexamethylene Diisocyanate (HDI) 28182-81-2	>=95%	PA3, NJ4, MA
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NJ4 –New Jersey Other – included in 5 predominant ingredients<0.3%

PA3 – Pennsylvania Non-hazardous present at 3% or greater.

CALIFORNIA PROPOSITION 65

To the best of our knowledge, this product contains no levels of listed substances, which the state of California has found to cause cancer, birth defects or other reproductive effects.

SECTION XVI: OTHER INFORMATION

HMIS RATINGS:

Health	2*
Flammability	2
Reactivity	1

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

* Chronic Health Hazard

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