KRETUS®

Safety Data Sheet

SECTION 1: IDENTIFICATION

Product Name: KRETUS® Urethane Polymer Concrete (UPC), Part B - RC UV AP

Recommended Use: For professional use only.

Manufacturer: Kretus, 1055 W. Struck Ave., Orange, CA 92867

Telephone: (714) 694-2061

24 Hour Emergency Telephone Number: (800) 255-3924 (CHEMTEL)

Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.
Comments: To the best of our knowledge, this Safety Data Sheet conforms to the requirements of US OSHA 29 CFR1910.1200, 91/155/EEC.

SECTION 2: HAZARD IDENTIFICATION

Emergency Overview: Danger. May cause allergic skin reaction. May cause skin, eye, and respiratory tract irritation. Harmful by inhalation and if swallowed.

Component Information/Information on Non-Hazardous Components: None known.

GHS Classification of the Substance or Mixture:
PHYSICAL HAZARDS:
None known.

HEALTH HAZARDS:
Inhalation -- Acute toxicity Category 4
Skin Sensitization Category 1
Specific Target Organ Toxicity – Single Exposure Respiratory Category 3

GHS Hazards Pictogram(s):

GHS Signal Word: WARNING

GHS Hazard Statement(s):
H317: May cause an allergic skin reaction.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.

GHS Precautionary Statement(s):

PREVENTION:
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.

Other Information:
No information available

Storage: Keep container tightly closed and locked in a cool, well-ventilated place.

Disposal: Dispose of contents/container to an approved waste disposal plant in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Read the entire SDS for a more thorough evaluation of the hazards. See Section 12 for Ecological Information.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret. The substances not listed in the table are in the inventory or exempt from listing.

Chemical Name	CAS No.	% by Weight	Comments
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	60~90	Acute toxicity Category 4 Inhalation. Respiratory sensitization Category 1 Specific target organ toxicity – single exposure Category 3 Respiratory system. Specific target organ toxicity – repeated exposure Category 2 Inhalation Lungs.
Hexamethylene-1,6-Diisocyanate	822-06-0	<0.5	Acute toxicity Category 4 Oral. Acute toxicity Category 1 Inhalation. Skin corrosion Category 1. Serious eye damage Category 1 Respiratory sensitization Category 1. Skin Sensitization Category 1. Specific target organ toxicity – single exposure Category 3 Respiratory System.
Dimethyl glutarate	1119-40-0	5~20	Substance with a Community workplace exposure limit
Dimethyl succinate	106-65-0	3~8	Eye Irritation Category 2.
Dimethyl adipate	627-93-0	1~4	Substance with a Community workplace exposure limit

See Section 11 for Ecological Information.

SECTION 4: FIRST-AID MEASURES

General advice: Take off all contaminated clothing immediately.

Inhalation: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

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 and persists. Thoroughly clean shoes before reuse. Wash clothing and other apparel before reuse.

Eye: In case of contact, flush eyes with plenty of lukewarm water for at least 10 minutes. Use fingers to ensure that eyelids are separated and the eye is being irrigated. Get medical attention.

Ingestion: If ingested, do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

Notes to Physician: Basic first aid, decontamination, symptomatic treatment.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Carbon dioxide (CO2), Foam, extinguishing powder, in cases of larger fires, water spray should be used.

Unsuitable Extinguishing Media: High volume water jet.

Unusual Fire and Explosion Hazards: Firefighters should wear NFPA approved self-contained breathing apparatus and full protective clothing. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. Toxic and irritating gases/fumes, including heated diisocyanate that is considered extremely dangerous, may be given off during burning or thermal decomposition.

Special hazards arising from the substance or mixture: Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen, isocyanate vapors and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.

Advice for Fire Fighters: During fire-fighting respirator with independent air-supply and airtight garment is required. Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Put on protective equipment (see section 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

Environmental Precautions: Do not allow to escape into waterways, wastewater or soil.

Methods for Cleaning up: Remove mechanically; cover the remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO2!). Keep damp in a safe ventilated area for several days.

SECTION 7: HANDLING AND STORAGE

Handling: Provide sufficient air exchange and/or exhaust in work rooms. Exhaust ventilation necessary if product is sprayed. The threshold limit values noted in section 8 must be monitored. In all areas where isocyanate aerosols and/or vapor concentrations are produced in elevated concentrations, exhaust ventilation must be provided in such a way that the workplace exposure limits (WEL) is not exceeded. The air should be drawn away from the personnel handling the product. The personal protective measures described in section 8 must be observed. The precautions required in the handling of isocyanates must be taken. Avoid contact with skin and eyes and the inhalation of vapor. Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

Storage: Keep container dry and tightly closed in a cool and well ventilated place. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Special Note for Exposure Control: Consult local authorities for acceptable exposure limits.

Chemical Name	Result	ACGIH/OSHA
Homopolymer of Hexamethylene Diisocyanate (CAS 28182-81-2)	STEL	0.07 mg/m3
	TWA	0.02 mg/m3
	PEL	No data available.
Hexamethylene-1,6- Diisocyanate (CAS 822-06-9)	STEL	0.07 mg/m3
	TWA	0.02 mg/m3
	PEL	No data available.

Engineering Measures/Controls: General dilution and local exhaust as necessary to control airborne vapors, mists, dusts, and thermal decomposition products below appropriate airborne concentration standards and 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 workplace.

Environmental Exposure Controls: Avoid release to the environment. Construct a dike to prevent spreading of spills. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating and drinking, smoking or using the lavatory and at the end of the working period. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment
Respiratory: Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended. In case of hypersensitivity of the respiratory tract and skin (e.g. asthmatics and those who suffer from chronic bronchitis and chronic skin complaint) it is inadvisable to work with the product.

Eye/Face: Wear eye/face protection.

Hands: Suitable materials for safety gloves; EN 374:
Butyl rubber - IIR: thickness >=0,5mm; breakthrough time >=480min.
Fluorinated rubber - FKM: thickness >=0,4mm; breakthrough time >=480min.
Recommendation: contaminated gloves should be disposed of.

Skin/Body: Wear suitable protective clothing

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid; colorless to pale yellow
Odor	Minimal to no odor; sweet
Odor Threshold	No Data Available
pH	Alkaline
Melting/Freezing Point	Not determined
Initial Boiling Point and Boiling Range	Decomposes
Flash Point	170°C (338°F) TCC
Evaporation Rate	Not Determined
Flammability	No Data Available
Upper/Lower Flammability or Explosive Limits	No Data Available
Auto-ignition Temperature	No Data Available

Vapor Pressure	No Data Available
Vapor Density	No Data Available
Relative Density	No Data Available
Specific Gravity	1.14 ± 0.1
Water Solubility	Reacts
Partition Coefficient: n-octanol/water	No Data Available
Decomposition Temperature	No Data Available
Viscosity	No Data Available
VOC (Volatile Organic Compounds)	0 g/L

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions described herein.

Possibility of Hazardous Reactions: Exothermic reaction with amines and alcohols; reacts slowly with water forming CO2, in closed containers risk of bursting owing to increase of pressure.

Conditions to Avoid: Extreme heat, open flame, and moisture. Keep away from ignition sources.

Incompatible Materials: Water, strong bases, strong acids, strong oxidizing agents, alcohols, and amines.

Hazardous Decomposition Products: Hydrolysis: carbon dioxide. Thermal: Oxides of nitrogen and oxygen.

SECTION 11: TOXICOLOGICAL INFORMATION

Hexamethylene-1,6-diisocyanate Homopolymer:

LD50 rat: > 5,000 mg/kg
LD50 rabbit, male/female: > 2,000 mg/kg (Studies of a comparable product.)
LD50 rat, male/female: > 2,000 mg/kg Method: OECD Test Guideline 402 (Studies of a comparable product.)
LC50 rat: 0.554 mg/l, 4 h Test atmosphere: dust/mist.The substance was tested in a form (i.e. specific particle size distribution) that is different from the forms in which the substance is placed on the market and in which it can reasonably be expected to be used. Based on the “split-entry” concept and available data on particle size during end-use of the substance a modified classification for acute inhalation toxicity is justified.

Converted acute toxicity point estimate 1.5 mg/l
Test atmosphere: dust/mist
Method: Expert judgement
Assessment: Harmful if inhaled.

Primary skin irritation
Species: rabbit
Result: slight irritant
Classification: No skin irritation

Primary mucosae irritation
Species: rabbit
Eye effect/Result: slight irritant
Classification: No eye irritation

Effect on the respiratory tract:

Classification: Irritating to respiratory system.

Sensitization
Skin sensitization according to Magnusson/Kligmann (maximizing test):
Species: guinea pig
Result: positive
Classification: May cause sensitization by skin contact.

Respiratory sensitization
No pulmonary sensitization observed in animal tests.
No pulmonary sensitization potential was observed in guinea pigs after either intradermal or inhalative induction with polyisocyanate based on hexamethylene diisocyanate.

Subacute, subchronic and prolonged toxicity
Application Route: Subacute inhalation toxicity, rat
Test concentration - 3,7 ; 17,5 and 76,6 mg aerosol/m^3
exposure time - 3 weeks (6 hours a day, 5 days a week)
3,7 mg/m^3 was tolerated without damage (NOEL),
17,5 mg/m^3 and 76,6 mg/m^3 caused increase of lung weight,
Pronounced concentration-dependent inflammatory changes in the respiratory tract.
All the changes were unspecific and are therefore attributed to the primary irritation potential of the product.
Evidence of damage to organs other than the organs of respiration was not found.
Toxicological studies of a comparable product.

Carcinogenicity
No data available.

Reproductive toxicity/Fertility
No data available.

Reproductive toxicity/Teratogenicity
No data available.

Genotoxicity in vitro
Test type: Salmonella/microsome test (Ames test)
Result: No indication of mutagenic effects.

Genotoxicity in vivo
Test type: Micronucleus test
Species: mouse
Result: negative

STOT evaluation – one-time exposure
May cause respiratory irritation.

STOT evaluation – repeated exposure
No data available.

Aspiration toxicity
No data available.

Additional information
Special properties/effects: Over-exposure, especially when spraying coatings containing isocyanate without the necessary precautions, entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract. Delayed appearance of the complaints and development of hypersensitivity (difficult breathing,

coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations, including concentrations below the U.S. Workplace Exposure Limit (WEL). Prolonged contact with the skin may cause tanning and irritant effects.

Animal tests and other research indicate that skin contact with diisocyanates can play a role in causing isocyanate sensitization and respiratory reaction.

SECTION 12: ECOLOGICAL INFORMATION

Hexamethylene-1,6-diisocyanate Homopolymer:

Acute Fish toxicity
LC50 > 100 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Acute toxicity for daphnia
EC50 > 100 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration. (Ecotoxicological reports on a comparable product.)

Acute toxicity for algae
ErC50 > 100 mg/l
Species: scenedesmus subspicatus
Exposure duration: 72 h
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Acute bacterial toxicity
EC50 > 100 mg/l
Species: activated sludge
Exposure duration: 3 h. (Ecotoxicological reports on a comparable product.)

Persistence and degradability
Biodegradability
Biodegradation: 1 %, 28 d, i.e. not readily degradable

Bioaccumulative
No data available.

Mobility in soil
No data available.

Other adverse effects
The resin reacts with water at the interface forming CO2 and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents. Previous experience shows that polyurea is inert and non-degradable.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Waste Treatment Methods: After final product withdrawal, all residues must be removed from containers (drip-free, powder-free, or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated. These containers can be returned for recycling to the appropriate centers set up within the framework of the existing take-back scheme of the chemical industry. Containers must be recycled in compliance with national legislation and environmental regulations.

SECTION 14: TRANSPORT INFORMATION

	UN Number	UN Proper Shipping Name	Transport Hazard Class(es)	Packing Group	Environmental Hazards
DOT	Not Regulated	<119gallon, Not Regulated	Not Regulated	Not Regulated	Not Regulated
IMO/IMDG	Not Regulated	Not Regulated	Not Regulated	Not Regulated	Not Regulated
IATA/CAO	Not Regulated	Not Regulated	Not Regulated	Not Regulated	Not Regulated

Special Precautions for User: When in individual containers containing less than the Product RQ, this product ships as non-regulated.

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code.

SECTION 15: REGULATORY INFORMATION

States Right to Know

Component	CAS	MA	NJ	PA
Hexamethylene-1,6-diisocyanate Homopolymer	28182-81-2	28182-81-2	28182-81-2	28182-81-2
Hexamethylene-1,6-diisocyanate	822-06-0	-	822-06-0	-

Inventory

Component	CAS	Canada DSL	Canada NDSL	TSCA
Hexamethylene-1,6-diisocyanate Homopolymer	28182-81-2	Listed	-	Listed
Hexamethylene-1,6-diisocyanate	822-06-0	Listed	-	Listed

United States
U.S. – CERCLA/SARA – Hazardous Substances and their Reportable Quantities: None
U.S. – SARA – Section 311/312 Hazard Categories: Acute Health Hazard, Chronic Health Hazard
U.S. – CERCLA/SARA – Section 302 Extremely Hazardous Substances TPQs: None

U.S. – CERCLA/SARA – Section 313 – Emissions Reporting: None
U.S. – CERCLA/SARA – Section 313 – PBT Chemical Listing: None
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) Components: None
U.S. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 372.65) Supplier Notification Required Components: None
U.S. Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261): Under RCRA it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

United States – California
U.S. – California – Proposition 65 – Carcinogens List: None
U.S. – California – Proposition 65 – Developmental Toxicity: None
U.S. – California – Proposition 65 – Maximum Allowable Dose Levels (MADL): None
U.S. – California – Proposition 65 – No Significant Risk Levels (NSRL): None
U.S. – California – Proposition 65 – Reproductive Toxicity – Female: None
U.S. – California – Proposition 65 – Reproductive Toxicity – Male: None

Based on information provided by KRETUS suppliers, this product is considered “DRC Conflict Free” as defined by the SEC Conflict Minerals Final Rule (Release No. 34-67716, File No. S7-40-10, Date 08-22-212).

SECTION 16: OTHER INFORMATION

Prepared by Kretus, Inc.

Disclaimer: The information and recommendations presented herein are accurate to the best of our knowledge. User must conduct their own tests to determine the suitability of these products for their particular purposes and usage. Because of numerous factors affecting results, KRETUS® and its affiliation makes no warranty of any kind, express or implied, including those of merchantability and fitness for purpose, other than material conforms to our applicable current specifications. KRETUS® assumes no legal responsibility for use or reliance on the information contained in this safety data sheet.