SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION

Product Identifiers

Product Name	:	**ARDEX R 54™ SM Part B Matte Crosslinker**
Code No.	:	N/Av
Trade Name/Synonyms	:	R 54 SM Part B
Material Use	:	Performance Sealer for Stain & Wear Protection
Restrictions on Use	:	Use only as recommended in the product's Technical Data Sheet. For professional use only.

Details of the Supplier

Manufacturer's name and address:

ARDEX L.P.
400 Ardex Park Dr.
Aliquippa, PA 15001 USA

Information Telephone No.	:	(724) 203-5000
Website Address	:	http://www.ardexamericas.com
24 Hr Emergency Telephone #	:	**CHEM-TEL: 1-800-255-3924 OR 1-813-248-0585 (call collect)**

SECTION 2 – HAZARDS IDENTIFICATION

GHS Classification per 29 CFR 1910.1200 (OSHA HCS 2012) and HPR (WHMIS 2015)

: Acute Toxicity, Inhalation; Category 4
Sensitization, Respiratory, Category 1
Sensitization, Dermal; Category 1
Specific Target Organ Toxicity, Single Exposure; Respiratory Tract Irritation; Category 3
Skin Irritation Category 2
Eye Irritation Category 2
Specific Target Organ Toxicity, Repeat Exposure; Category 2

GHS Pictograms :

Signal Word

: Danger

Hazard Statements

: Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause skin irritation, eye irritation, and respiratory irritation.
May cause damage to lungs through prolonged or repeated exposure by inhalation.

Precautionary Statements : Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. In case of inadequate ventilation wear respiratory protection that meets the requirements in OSHA's Respiratory Protection Standard (29 CFR 1910.134) or regional standards. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands and exposed skin thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Wash contaminated clothing before reuse.
Store in a well-ventilated place. Keep container tightly closed. Store locked up. Dispose of contents / container in accordance with federal, state, and local laws. Do not allow product to enter drains.

Hazards Not Otherwise Classified: Contains isocyanates. Reacts vigorously with water, alcohols, amines. Reaction could release heat, potentially causing burns. Reaction with water releases carbon dioxide gas. Do not heat or spray this product. Do not sand, grind, or weld on surfaces coated with this product.

% Composition with unknown acute toxicity data
: Less than 1% of this product consists of ingredients with unknown acute toxicity.

Special Instructions : Contains Isocyanates. Use according to the directions. Do not spray or heat.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS #	% (by weight)
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	60 - 80
Hydrophilic Aliphatic Polyisocyanate based on Hexamethylene Diisocyanate	666723-27-9	10 – 30
Hexamethylene-1,6-Diisocyanate	822-06-0	< 0.5

The exact percentages of the ingredients are withheld as trade secrets.

SECTION 4 – FIRST AID MEASURES

First Aid

General Information : See a doctor/physician if you feel unwell. Show this Safety Data Sheet (SDS) to medical personnel.

Inhalation : Remove person to fresh air and keep at rest in a position comfortable for breathing. IF respiratory symptoms persist, call a POISON CENTER or doctor/physician immediately.
Extreme asthmatic reactions that may occur in sensitized persons can be life threatening. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours.

Eye Contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Then remove contact lenses, if contact lenses are present and easily removable. Continue eye irrigation for not less than 15 minutes. Get medical attention.

Skin Contact : If direct skin contact with isocyanates occurs, immediately remove contaminated clothing and shoes. Wipe off the isocyanate product from the skin using dry towels or other similar absorbent fabric. Wash with soap and warm water for 15 minutes and pat dry. Get medical attention if irritation or rash develops. Discard or wash contaminated clothing before reuse.

Ingestion : Do NOT induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to Physician : *Eyes*: 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 for contact dermatitis or thermal burn. Chemical burn symptoms may be delayed.

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.

Most Important Symptom(s)/Effect(s)

Acute Exposure

Respiratory : Isocyanate vapors or mist at concentrations above the exposure limits or guidelines can irritate, producing a burning sensation in the mucous membranes of the respiratory tract (nose, throat, lungs). Symptoms such as runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing difficulty) are possible. Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the exposure limits or guidelines. Persons who have been sensitized to isocyanates may present with asthma 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.

Skin Contact : May cause skin 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.

Eye Contact : May cause eye irritation with symptoms of reddening, tearing, stinging, swelling, and pain. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

Ingestion : May cause irritation of the digestive tract; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Chronic Exposure : After repeated overexposures or a single high dose, some individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) which may cause them to react to future exposure to diisocyanates at levels well below the VLE or NET. These symptoms, which may include chest tightness, wheezing, coughing, shortness of breath, or an asthmatic attack, may be immediate or delayed for up to several hours following exposure. Extreme asthmatic reactions can be life threatening. As with many non-specific asthmatic reactions, there are reports that once sensitized an individual may 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 years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decreased lung function) which may be permanent.
Prolonged contact may cause redness, swelling, rash and in some cases skin sensitization. Animal testing and other research indicates that skin contact with an MDI polymer may play a role in causing isocyanate sensitization and respiratory reaction. These data reinforce the need to prevent direct skin contact with isocyanates.

Indication of need for immediate medical attention or special treatment

: Difficulty breathing persists after removing the person to fresh air.
Any exposure to the eye which causes irritation.
Any exposure to the skin, causing a rash, swelling, itching, or pain.
Ingestion.

SECTION 5 – FIRE FIGHTING MEASURES

Suitable extinguishing media : Dry chemical, carbon dioxide, foam, water spray.

Unsuitable extinguishing media : High pressure water jet may spread the fire. Isocyanates react with water to produce heat and evolve (non-flammable, non-respirable) gases.

Hazardous combustion products : Carbon monoxide carbon dioxide, nitrogen oxides, isocyanate vapors, and low levels of hydrogen cyanide. Vapors/fumes are toxic.

Fire hazards/conditions of flammability

: Vapors will ignite at high temperatures. In a fire, this product will generate toxic vapors. High temperatures may cause closed containers to rupture. Chemical reaction of this product with water will generate CO2 gas, which can also cause containers to rupture. 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.

Special fire-fighting procedures/equipment

: Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots, and gloves, plus a gas-tight hazmat suit. 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.

Flammability classification (OSHA 29 CFR 1910.1200, WHMIS 2015)

: Not classified as flammable, but this product will burn when heated above its flash point.

Flash point	: 365°F (185°C)	**Lower flammable limit (% by vol)**	: Not available
Flash point method	: Setaflash closed cup	**Upper flammable limit (% by vol)**	: Not available
Auto-ignition temperature	: ca. 445°C (833°F)	**Oxidizing properties**	: Not oxidizing
Flame projection length	: Not available	**Flashback observed**	: Not available

Explosion data: Sensitivity to mechanical impact / static discharge

: Not explosive. Not expected to be sensitive to mechanical impact or static discharge.

NFPA Rating : 0 - Minimal 1 – Slight 2 – Moderate 3 – Serious 4 – Severe

Health: 2 *Flammability* 1 *Reactivity* 1 *Special Hazards:* None

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions : See Section 7 for safe handling procedures. Wear chemically resistant personal protective equipment during cleanup. Restrict access to area until completion of clean-up. All persons dealing with clean-up must be properly trained and wear the appropriate chemically protective equipment. Refer to Section 8 for additional information on acceptable personal protective equipment.

Environmental precautions : Do not allow product to enter waterways. Do not allow material to contaminate ground water system.

Spill response / clean-up : Follow this procedure to clean up spills of this product.

1. Ventilate area of release. Stop spill or leak at source if safely possible.
2. Contain product with inert absorbent material, preventing it from entering sewer lines or waterways. Cover the spill area with suitable absorbent material (e.g., vermiculite, kitty litter, Oil-Dri®, etc.). Allow for the absorbent material to absorb the spilled liquid.
3. Shovel the absorbent material into an approved metal container (e.g. 55-gallon salvage drum). Do not fill the container more than 2/3 full to allow for expansion, and do not tighten the lid on the container.
4. Repeat application of absorbent material until all liquid has been removed from the surface.
5. After removing spilled material as described above, decontaminate surfaces involved with the spill using a neutralization solution.
   5a. Mix detergent floor cleaner [if a concentrate, dilute 1 part concentrate into 9 parts water] and about 10% household ammonia.
6. Scrub the surface with a broom or brush to help the decontamination solution penetrate porous surfaces. Use caution, as the surface may be slippery.
7. Wait at least 15 minutes after first application of the neutralization solution. Keep recovered isocyanate material separate from contaminated neutralization solution. Put them in separate containers.
8. Cover the area with absorbent material and shovel this into an approved metal container. Note: Always wear proper PPE when cleaning up an isocyanate spill and

using a neutralization solution. It may take two or more applications of the neutralization solution to decontaminate the surface.
9. Clean up any detergent residue with fresh water.

10. With the lid still loosely in place, move the containers (separately holding the isocyanate waste and decontamination solution waste) to an isolated, well-ventilated area to allow release of carbon dioxide. After 72 hours, seal the container, and properly dispose of the waste material in accordance with existing federal, state, and local regulations.

Prohibited materials : Avoid strong oxidizing agents. Do not allow spilled material to mix with alcohols, amines (including polyols and polyamines), and water. Chemical reaction with these materials causes polymerization and release of heat energy.

Special spill response procedures : If a spill/release exceeding the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802). Outside of the U.S. call the emergency number listed in Section 1.

US CERCLA Reportable quantity (RQ): 822-06-0 hexamethylene-1,6-diisocyanate: 100 lbs (45.45 kg).

SECTION 7 – HANDLING AND STORAGE

Safe handling procedures : Do NOT get into eyes, on skin or on clothing. Do NOT breathe vapor, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. This material must not be heated, sprayed, or used in a confined space. or if the exposure limit is exceeded. (See Section 8.) If ventilation is insufficient, wear respiratory protection. Wear appropriate eye and skin protection. 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 eat, drink, or smoke in the work area. Wash thoroughly after handling. Promptly remove any clothing that becomes contaminated. Clean or discard contaminated clothing before reuse. Keep container tightly closed.

Storage requirements : Store in a cool, dry, well-ventilated area. Store away from heat and open flame. Avoid storing in direct sunlight. Keep from freezing. Recommended storage temperature range is between 18 °C and 29 °C (65 °F and 85 °F). DO NOT EXCEED 49 °C/120 °F. Store in original container. Keep tightly closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning.

Incompatible materials : Water, Amines, Strong bases, Alcohols, Copper metal and copper alloys.

Special packaging materials : Always keep in containers made of the same materials as the supply container.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

The recommendations in this section should not be a substitute for a Personal Protective Equipment (PPE) assessment performed by the employer as required by 29 CFR 1910 Subpart I.

Permissible exposure limits

Component	CAS #	ACGIH TLV		NIOSH REL		Manufacturer's Recommended Exposure Limits	
		TLV	STEL	TWA	CEIL	TWA	STEL
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	N/Av	N/Av	N/Av	N/Av	0.5 mg/m^3	1.0 mg/m^3 (15 minutes)
Hydrophilic Aliphatic Polyisocyanate based on Hexamethylene Diisocyanate	666723-27-9	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av
Hexamethylene-1,6-Diisocyanate	822-06-0	0.005 ppm	N/Av	0.005 ppm	0.02 ppm 10 min	N/Av	N/Av

Ventilation and engineering measures: Use general or local exhaust ventilation to maintain air concentrations below recommended exposure limits. Ventilation should effectively remove and prevent buildup of any vapor or mist generated from the handling of this product. 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 (for example, spraying or heating isocyanates or during major spill clean-up), the use of respirators and other personal protective equipment is mandated. See "Respiratory protection" below.

Respiratory protection : If a work process generates excessive quantities of vapor, or exposures exceeding any PEL, wear a NIOSH approved organic vapor cartridge respirator.

Skin protection : Wear chemical resistant protective clothing and impervious gloves. Proper protective clothing includes long sleeves and pants. Glove materials such as Nitrile rubber, Butyl rubber, Neoprene, or Viton (fluorocarbon rubber) are recommended. Consult with glove manufacturers regarding the breakthrough time for the chemicals listed in Section 3.

Eye / face protection : Chemical goggles must be worn when using this product. A face shield is recommended if splashing is possible.

Other protective equipment : Where extensive exposure to product is possible, use resistant coveralls, apron, and boots to prevent contact. An eyewash station and safety shower must be made available in the immediate working area.

General hygiene considerations : Avoid contact with eyes, skin, and clothing. Do not breathe vapors/dust. Do not eat, drink, or smoke when using this product. Clean all equipment and clothing at end of each work shift. Contaminated work clothing should not be allowed out of the workplace.

Medical surveillance : All workers 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.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Liquid	**Appearance**	:	Light Yellow
Odor	:	Slight	**Odor threshold**	:	N/Av
pH	:	N/Ap (reacts with water!)	**Specific gravity**	:	1.15
Boiling point	:	Decomposes before boiling			
Coefficient of water/oil distribution	:	N/Ap (reacts with both water and 1-octanol)			
Melting/Freezing point	:	N/Av	**Solubility in water**	:	Immiscible @ 15°C
Vapor pressure (mm Hg @ 20°C / 68°F)	:	5.2 x 10^-9 mm Hg (20°C)			
Decomposition temperature	:	181°C (357.8°F)			
Vapor density (Air = 1)	:	N/Av	**Evaporation rate (*n*-Butyl acetate = 1)**	:	N/Av
Volatile organic compounds (VOCs)	:	0 g/L A+B per ASTM D2369			
General information	:	N/Av	**Volatiles (% by weight)**	:	N/Av
Particle size	:	N/Av	**Flammability properties**	:	See Section 5.
Dynamic Viscosity	:	800 mPa.s @20°C	**Kinematic Viscosity**	:	N/Av

SECTION 10 – REACTIVITY AND STABILITY INFORMATION

Stability and reactivity : Stable under the recommended storage and handling conditions prescribed. Reacts with water, generating large quantities of carbon dioxide gas. Reacts with amines and alcohols, in some cases generating high temperatures.

Hazardous polymerization : When handled according to the directions in the Technical Data Sheet, this product chemically reacts with ARDEX R 54 SM Part A to form a polymer, generating low levels of heat. This product reacts with polyols, alcohols, amines, and water. Under certain conditions, this reaction can generate enough heat to burn or scald, as well as release toxic fumes. Heating this product to temperatures above 350°F (177°C) may also cause

polymerization. Only use this product according to the directions on the Technical Data Sheet.

Conditions to avoid : Avoid exposure to excessive heat, flames, or sparks. Protect from freezing.

Materials to avoid and incompatibility

: Water, Amines, Strong bases, Alcohols, Copper metal or copper alloys.

Hazardous decomposition products

: Refer to hazardous combustion products in Section 5.

SECTION 11 – TOXICOLOGICAL INFORMATION

Affected Organs : Lungs, Skin

Routes of Exposure : *Inhalation:* YES *Skin Absorption:* YES *Skin and Eyes:* YES *Ingestion:* YES

Health Effects and Symptoms : See Section 4, **Most Important Symptom(s)/Effect(s).**

Calculated Acute Toxicity Estimates for the Product

Inhalation : > 1.0 mg/L* (Dust, Mist)

Oral : > 4000 mg/kg

Dermal : > 10,000 mg/kg

Toxicological data : See below for individual ingredient acute toxicity data.

Ingredients	CAS No.	LC50 (4 hr) Inhalation, rat mg/L, dust/mist	LD50 Oral, rat mg/kg	LD50 Dermal, rabbit mg/kg
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	1.5*	> 5000	N/Av
Hydrophilic Aliphatic Polyisocyanate based on Hexamethylene Diisocyanate	666723-27-9	0.5*	> 5000	> 2000
Hexamethylene-1,6-Diisocyanate	822-06-0	0.5*	746	> 7000

*ATE values are calculated based on acute toxicity test results for the individual components. In the inhalation tests on individual components, the test atmosphere generated in the animal study is not representative of workplace environments, and how it can reasonably be expected to be used in the workplace. Therefore, the test result cannot be directly applied for the purpose of assessing hazard. Based on expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Irritancy/Corrosivity : Irritating to the respiratory system. Irritating to eyes and skin.

Repeated Dose Effects : Chronic overexposure to diisocyanates has been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

Carcinogenic status : No components are listed as carcinogens by ACGIH, IARC, OSHA, NIOSH or NTP.

Reproductive effects : None known.

Teratogenicity : None known.

Germ Cell Mutagenicity : None known.

Epidemiology : Not available.

Target Organ Effects : Isocyanates are known to cause respiratory irritation (single exposure) and may cause lung damage after prolonged or repeated inhalation exposure.

Sensitization to material : Contains isocyanates, which as a class, are known to cause both respiratory and skin sensitization reactions.

Aspiration hazard : None known.

Synergistic materials : None known.

Other important hazards : See hazards listed in Section 2.

SECTION 12 – ECOLOGICAL INFORMATION

Environmental effects : The product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters.

12.1 Toxicity
Acute Fish toxicity

hexamethylene-1,6-diisocyanate homopolymer
LC50 > 100 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: Directive 67/548/EEC, Annex V, C.1.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Hydrophilic aliphatic polyisocyanate based on HDILC50 35.2 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: OECD Test Guideline 203
Ecotoxicological reports on a comparable product

Chronic Fish toxicity

hexamethylene-1,6-diisocyanate homopolymer
Study scientifically not justified.

Hydrophilic aliphatic polyisocyanate based on HDI
Study scientifically not justified.

Acute toxicity for daphnia

hexamethylene-1,6-diisocyanate homopolymer
EC50 > 100 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Hydrophilic aliphatic polyisocyanate based on HDI
EC50 > 100 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202
Ecotoxicological reports on a comparable product

Chronic toxicity to daphnia

hexamethylene-1,6-diisocyanate homopolymer
Study scientifically not justified.

Hydrophilic aliphatic polyisocyanate based on HDI
Study scientifically not justified.

Acute toxicity for algae

hexamethylene-1,6-diisocyanate homopolymer
ErC50 199 mg/l
Test type: Growth inhibition
Species: scenedesmus subspicatus
Exposure duration: 72 h
Method: Directive 67/548/EEC, Annex V, C.3.
Sample preparation on account of the reactivity of the substance with water:
Ultra turrax: 60 sec. 8000 rpm; 24h magnetic stirrer; Filtration.

Hydrophilic aliphatic polyisocyanate based on HDI
ErC50 72 mg/l
Species: Desmodesmus subspicatus (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201
Ecotoxicological reports on a comparable product

Acute bacterial toxicity

hexamethylene-1,6-diisocyanate homopolymer
EC50 > 10,000 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h
Method: EG-RL 88/302/EEC

Hydrophilic aliphatic polyisocyanate based on HDI
EC50 > 10,000 mg/l
Species: activated sludge
Method: OECD Test Guideline 209
Ecotoxicological reports on a comparable product

Ecotoxicology Assessment

hexamethylene-1,6-diisocyanate homopolymer
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: Based on available data, the classification criteria are not met.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

12.2 Persistence and degradability

Biodegradability

hexamethylene-1,6-diisocyanate homopolymer
Test type: aerobic
Biodegradation: 2 %, 28 d, i.e. not readily degradable
Method: Directive 67/548/EEC Annex V, C.4.E.
Ecotoxicological studies of the product

Test type: aerobic
Biodegradation: 0 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 C
Ecotoxicological studies of the product

Hydrophilic aliphatic polyisocyanate based on HDI
Biodegradation: 0 %, i.e. not readily degradable
Method: OECD Test Guideline 301 F
Ecotoxicological reports on a comparable product

Stability in water

hexamethylene-1,6-diisocyanate homopolymer
Test type: Hydrolysis
Half life: 7.7 h at 23 °C
Method: OECD Test Guideline 111
The substance hydrolyzes rapidly in water.
Studies of a comparable product.

Photodegradation

hexamethylene-1,6-diisocyanate homopolymer
Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 11.7 h
Method: SRC - AOP (calculation)
After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 3.1 h
Method: SRC - AOP (calculation)
After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.
Studies of hydrolysis products.

Volatility (Henry's Law constant)

hexamethylene-1,6-diisocyanate homopolymer
Calculated value = < 0.000001 Pa*m3/mol at 25 °C
Method: Bond-method
The substance has to be scored as non-volatile from water.

Calculated value = < 0.000001 Pa*m3/mol at 25 °C
Method: Bond-method
The substance has to be scored as non-volatile from water.
Studies of hydrolysis products.

12.3 Bioaccumulative potential

Bioaccumulative

hexamethylene-1,6-diisocyanate homopolymer
Bioconcentration factor (BCF): 706.2
Method: (calculated)
The substance hydrolyzes rapidly in water.
An accumulation in aquatic organisms is not to be expected.

Bioconcentration factor (BCF): 10.11
Method: (calculated)
An accumulation in aquatic organisms is not to be expected.
Studies of hydrolysis products.

12.4 Mobility in soil

Distribution among environmental compartments

hexamethylene-1,6-diisocyanate homopolymer
Adsorption/Soil
not applicable

Environmental distribution

hexamethylene-1,6-diisocyanate homopolymer
not applicable

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Isocyanate 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 water soluble solvents. Previous experience shows that polyurea is inert and non-degradable.

SECTION 13 – DISPOSAL CONSIDERATION

Handling for disposal	:	Handle waste according to recommendations in Section 7.
Methods of disposal	:	Waste disposal should be in accordance with existing federal, state, and local environmental control laws.
Packaging	:	Handle contaminated packaging in the same manner as the product.
RCRA	:	For disposal of unused or waste material, check with local, state, and federal environmental agencies.

SECTION 14 – TRANSPORTATION INFORMATION

DOT/TDG Ground Transport

14.1 UN number or ID number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

Dangerous goods classification for inland waterways tanker by request only.

IATA

14.1 UN number or ID number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

IMDG

14.1 UN number or ID number	:	Not dangerous goods
14.2 UN proper shipping name	:	Not dangerous goods
14.3 Transport hazard class(es)	:	Not dangerous goods
14.4 Packing group	:	Not dangerous goods
14.5 Environmental hazards	:	Not dangerous goods

This product is not transported in containers larger than the Reportable Quantity (RQ):

hexamethylene-1,6-diisocyanate: 100 lbs (45.45 kg).

SECTION 15 – REGULATORY INFORMATION

Canadian Information:

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR). This SDS contains all information required by the HPR.

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on either the Domestic Substances List (DSL) or the Non- Domestic Substances List (NDSL).

US Federal Information:

TSCA: All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

CERCLA Reportable Quantity (RQ) (40 CFR 117.302): 822-06-0 Hexamethylene-1,6-Diisocyanate – 100 lbs (45.45 kg)..

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes:

Acute Toxicity, Inhalation; Category 4
Sensitization, Respiratory, Category 1
Sensitization, Dermal; Category 1
Specific Target Organ Toxicity, Single Exposure; Respiratory Tract Irritation; Category 3
Skin Irritation Category 2
Eye Irritation Category 2

SARA TITLE III: Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material is not subject to SARA notification requirements, as it does not contain Toxic Chemical constituents above *de minimus* concentrations.

U.S. State Right To Know Laws

California Proposition 65: This product does not contain any chemicals known to the State of California to cause cancer and/or reproductive effects.

Other State Right to Know Laws:

Component	CAS	CA	MA	MN	NJ	NY	PA	RI
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	No	No	No	No	No	No	No
Hexamethylene-1,6-Diisocyanate	822-06-0	Yes	Yes	Yes	Yes	Yes	No	No

SECTION 16 – OTHER INFORMATION

HMIS Rating : * - Chronic Hazard 0 - Minimal 1 – Slight 2 – Moderate 3 – Serious 4 – Severe

Health: *2 *Flammability* 1 *Physical Hazard* 1

Recommended PPE: Gloves, safety glasses with side shields, vapor respirator

Legend **:** ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
DOT: Department of Transportation
DSL: Domestic Substances List
EPA: Environmental Protection Agency
GHS: Globally Harmonized System
HPR: Hazardous Products Regulations
IARC: International Agency for Research on Cancer
Inh: Inhalation
N/Av: Not Available
N/Ap: Not Applicable
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
RCRA: Resource Conservation and Recovery Act
SARA: Superfund Amendments and Reauthorization Act
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

Disclaimer of Liability

The Information presented herein is supplied as a guide to those who handle or use this product and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive. The manner and conditions of use and handling may involve

other and additional considerations. Safe work practices must be employed when working with any materials. It is important that the end user determines the adequacy of the safety procedures employed during the use of this product.
No warranty of any kind is given or implied. ARDEX L.P. will not be liable for any damages, losses, injuries, or consequential damages which may result from the use or reliance on any information contained herein.

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Revision date: **:** 22-Jan-23

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