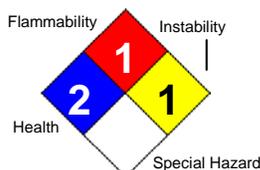


## 441/442 Waterbourne Urethane Topcoat

## Hardener Part B



<b>HEALTH</b>	*	2
<b>FLAMMABILITY</b>	1	1
<b>PHYSICAL</b>	1	
<b>PPE</b>		X



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## 1. Product and Company Identification

<b>Product Code:</b>	441/442-RCB		
<b>Product Name:</b>	441/442 Waterbourne Urethane Finishcoat Hardener Part B		
<b>Trade Name:</b>	441/442 Waterbourne Urethane Finishcoat Hardener Part B		
<b>Manufacturer/Distributor Information</b>			
<b>Company Name:</b>	Epoxy Systems, Inc. 20774 W Pennsylvania Ave Dunnellon, FL 34431		
<b>Phone Number:</b>	+1 (352) 489-1666		
<b>Emergency Contact:</b>	PERS (USA)	(800)633-8253	
<b>Alternate Emergency Contact:</b>	PERS (International)	+1 (801) 629-0667	

## 2. Hazards Identification

GHS Classification	Placard	Key word	GHS hazard phrase
Skin Corrosion/Irritation, Category 2	Exclamation point	Warning	Causes skin irritation
Serious Eye Damage/Eye Irritation, Category 2A	Exclamation point	Warning	Causes serious eye irritation
Respiratory Sensitization, Category 1	Health hazard	Danger	May cause allergy or asthma symptoms or breathing difficulties if inhaled
Acute Toxicity: Inhalation, Category 4	Exclamation point	Warning	Harmful if inhaled
Target Organ Systemic Toxicity (repeated exposure), Category 2	Health hazard	Warning	May cause damage to lungs through prolonged or repeated exposure.
Target Organ Systemic Toxicity (single exposure), Category 3	Exclamation point	Warning	May cause respiratory irritation, or may cause drowsiness and dizziness

### GHS Hazard Phrases

- H315 - Causes skin irritation.
- H319 - Causes serious eye irritation.
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H332 - Harmful if inhaled.
- H373 - May cause damage to lungs through prolonged or repeated exposure.
- H335 - May cause respiratory irritation.

### GHS Precaution Phrases

- P262 - Do not get in eyes, on skin, or on clothing.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
- P285 - In case of inadequate ventilation wear respiratory protection.

### GHS Response Phrases

- P302+352 - IF ON SKIN: Wash with plenty of soap and water. P332+313 - If skin irritation occurs, get medical advice/attention. P362 - Take off contaminated clothing.
- P305+351+338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+313 - If eye irritation persists, get medical advice/attention.
- P304+341 - IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. P342+311 - If experiencing respiratory symptoms call a POISON CENTER or doctor/physician.

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P301+330+331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P313 - Get medical advice/attention.

**GHS Storage and Disposal Phrases**

P501 - Dispose of contents/container to local, state, and federal authority requirements.

P402+404 - Store in a dry place and/or in closed container.

**Potential Health Effects (Acute and Chronic)**

May cause sensitization. Moderate irritant.

**Inhalation**

May cause respiratory tract irritation. May cause sensitization by inhalation. May cause allergic respiratory reaction.

**Skin Contact**

Causes skin irritation. May cause sensitization by skin contact.

**Eye Contact**

Causes eye irritation.

**Ingestion**

May be harmful if swallowed.

**Recommended Exposure Limits**

Homopolymer of Hexamethylene Diisocyanate (28182-81-2)

Exposure Limit

time weighted average 0.5 mg/m<sup>3</sup>

Exposure Limit

Short Term Exposure Limit (STEL): 1.0 mg/m<sup>3</sup> (15-min)

Hexamethylene-1,6-Diisocyanate (822-06-0)

ACGIH Threshold Limit Values

Time Weighted Average (TWA): 0.005 ppm

Exposure Limit

Ceiling Limit Value: 0.02 ppm

**Medical Conditions Generally Aggravated By Exposure**

Skin disorders, Respiratory disorders, Eye disorders, Skin Allergies.

**OSHA Regulatory Status:**

This material is classified as hazardous under OSHA regulations.

**3. Composition/Information on Ingredients**

Hazardous Components (Chemical Name)	CAS #	Concentration
1. Poly(hexamethylene diisocyanate)	28182-81-2	60 - 100 %
2. Cyclohexanamine, N,N-dimethyl-, compds. with 3-(cyclohexylamino)-1-propanesulfonic acid-blocked 1,6-diisocyanatohexane homopolym	666723-27-9	15 - 25 %
3. Dimethylcyclohexyl amine	98-94-2	0.10 - 1.0 %
4. Hexamethylene-1,6-diisocyanate	822-06-0	0.10 - 1.0 %

**4. First Aid Measures**

**Emergency and First Aid Procedures**

Use first aid treatment according to the nature of the injury. Keep victim under observation. Get immediate medical advice/attention.

**In Case of Inhalation**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If experiencing respiratory symptoms: Get medical attention immediately.

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**In Case of Skin Contact**

In case of contact, immediately wash skin with soap and copious amounts of water. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists.

**In Case of Eye Contact**

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

**In Case of Ingestion**

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately. Do not induce vomiting. For further assistance, contact your local Poison Control Center.

**Signs and Symptoms Of Exposure**

Acute or chronic overexposure to isocyanates may cause sensitization in some individuals, resulting in allergic respiratory reactions including wheezing, shortness of breath and difficulty breathing.

**5. Fire Fighting Measures**

**Flash Pt:** ~ 365.00 F

**Explosive Limits:** LEL: NE UEL: NE

**Autoignition Pt:** No data available.

**Fire Fighting Instructions**

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

**Flammable Properties and Hazards**

Product is not considered a fire hazard. Closed containers may rupture (due to build up in pressure) when exposed to extreme heat.

**Hazardous Combustion Products**

Hazardous decomposition products formed under fire conditions. Carbon dioxide, Carbon monoxide, Hydrogen cyanide, Nitrogen oxides, Isocyanates.

**Suitable Extinguishing Media**

CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam. Use water spray to cool unopened containers.

**Unsuitable Extinguishing Media**

Do not use water because of violent reaction.

**6. Accidental Release Measures**

**Steps To Be Taken In Case Material Is Released Or Spilled**

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL.

Ventilate the area. Dike far ahead of spill; use dry sand to contain the flow of material. Shovel into open container. Do not close container tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

**Protective Precautions, Protective Equipment and Emergency Procedures**

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves. Where splashing is possible, full chemically resistant protective clothing, and boots are required.

**Environmental Precautions**

Prevent entry into waterways, sewers, basements or confined areas.

**7. Handling and Storage**

**Hazard Label Information:**

Avoid contact with skin and eyes. Do not get on skin and clothing. Avoid inhalation of vapor or mist. Store in a closed container.

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**Precautions To Be Taken in Handling**

Provide adequate ventilation. Do not breathe vapor. Do not get in eyes, on skin or on clothing.

**Precautions To Be Taken in Storing**

Keep container tightly closed in a dry and well-ventilated place. Protect from moisture. Store away from incompatible material. Keep from freezing.

**Other Precautions**

Wash thoroughly after handling.

**8. Exposure Controls/Personal Protection**

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Poly(hexamethylene diisocyanate)	28182-81-2	No data.	No data.	No data.
2. Cyclohexanamine, N,N-dimethyl-, compds. with 3-(cyclohexylamino)-1-propanesulfonic acid-blocked 1,6-diisocyanatohexane homopolym	666723-27-9	No data.	No data.	No data.
3. Dimethylcyclohexyl amine	98-94-2	No data.	No data.	No data.
4. Hexamethylene-1,6-diisocyanate	822-06-0	No data.	0.005 ppm	No data.

**Protective Equipment Summary - Hazard Label Information:**

Neoprene gloves Safety glasses, or goggles. Impervious clothing. Chemical resistant boots

**Respiratory Equipment (Specify Type)**

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

**Eye Protection**

Safety glasses, or goggles.

**Protective Gloves**

Nitrile rubber and Neoprene are recommended.

**Other Protective Clothing**

Where splashing is possible, full chemically resistant protective clothing, safety glasses or face shield and boots are required.

**Engineering Controls (Ventilation etc.)**

Ventilation is normally required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Good general ventilation should be sufficient to control airborne levels. Safety shower and eye bath.

**Work/Hygienic/Maintenance Practices**

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

**Environmental Exposure Controls**

Avoid runoff into storm sewers and ditches which lead to waterways. May be hazardous to the environment if released in large quantities.

**9. Physical and Chemical Properties**

<b>Physical States:</b>	[ ] Gas [ X ] Liquid [ ] Solid
<b>Melting Point:</b>	NE
<b>Boiling Point:</b>	~ 355.00 F
<b>Decomposition Temperature:</b>	~ 355.00 F
<b>Autoignition Pt:</b>	No data.

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**Flash Pt:** ~ 365.00 F  
**Explosive Limits:** LEL: NE UEL: NE  
**Specific Gravity (Water = 1):** ~ 1.15  
**Density:** ~ 9.6 LB/GL  
**Vapor Pressure (vs. Air or mm Hg):** NE  
**Vapor Density (vs. Air = 1):** NE  
**Evaporation Rate:** NE  
**Solubility in Water:** nil

**Solubility Notes**

Insoluble. Reacts with water.

**Percent Volatile:** 0.0 % by volume.  
**VOC / Volume:** NP  
**HAP / Volume:** NP  
**Saturated Vapor Concentration:** NE

**Appearance and Odor**

Clear. Slight odor.

Appearance: Light. Yellowish.

**10. Stability and Reactivity**

**Stability:** Unstable [ ] Stable [ X ]

**Reactivity**

Avoid: acids, amines, alcohols, water, alkalines, strong bases. Reacts with water, with formation of carbon dioxide. Copper alloys.

**Conditions To Avoid - Instability**

Moisture. Extreme temperatures.

**Incompatibility - Materials To Avoid**

Avoid: acids, amines, alcohols, water, alkalines, strong bases. Copper alloys.

**Hazardous Decomposition Or Byproducts**

Thermal decomposition may produce smoke, carbon monoxide, carbon dioxide, Hydrogen cyanide, aromatic isocyanates, gases/vapors. Isocyanates.

**Possibility of Hazardous** Will occur [ ] Will not occur [ X ]

**Polymerization:**

**Conditions To Avoid - Hazardous Reactions**

Will not undergo hazardous polymerization in normal storage conditions.

**11. Toxicological Information**

**Toxicological Information**

May cause sensitization by skin contact. The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

**Chronic Toxicological Effects**

May cause sensitization by skin contact. May cause sensitization by inhalation. The substance may cause damage to the olfactory epithelium after repeated inhalation.

**Irritation or Corrosion**

Respiratory or skin sensitization. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering.

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### Symptoms related to Toxicological Characteristics

The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

### Sensitization

Assessment of sensitization:

The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible. Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

### Carcinogenicity/Other Information

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.

Experimental/calculated data:

OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m<sup>3</sup>

Result: Lung tumors.

Hazardous Components (Chemical Name)	CAS #	NTP	IARC	ACGIH	OSHA
1. Poly(hexamethylene diisocyanate)	28182-81-2	n.a.	n.a.	n.a.	n.a.
2. Cyclohexanamine, N,N-dimethyl-, compds. with 3-(cyclohexylamino)-1-propanesulfonic acid-blocked 1,6-diisocyanatohexane homopolym	666723-27-9	n.a.	n.a.	n.a.	n.a.
3. Dimethylcyclohexyl amine	98-94-2	n.a.	n.a.	n.a.	n.a.
4. Hexamethylene-1,6-diisocyanate	822-06-0	n.a.	n.a.	n.a.	n.a.

## 12. Ecological Information

### General Ecological Information

Avoid release to the environment. May be hazardous to the environment if released in large quantities.

### Results of PBT and vPvB assessment

No data available.

### Persistence and Degradability

Poor Degradability.

### Bioaccumulative Potential

Hydrophilic Aliphatic Polyisocyanate based on Hexamethylene Diisocyanate : 0 %, not readily degradable.

Homopolymer of Hexamethylene Diisocyanate: 0 %, Exposure time: 28 Days, Not readily biodegradable.

N,N-dimethylcyclohexylamine: Aerobic, > 70 %, Exposure time: 28 Days.

### Mobility in Soil

Adsorption to solid soil phase is not expected.

## 13. Disposal Considerations

### Waste Disposal Method

Dispose of this product, product solutions and its container according to federal, state and local authority requirements. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum. Avoid release to the environment.

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**14. Transport Information**

**LAND TRANSPORT (US DOT)**

**DOT Proper Shipping Name** Not Regulated.  
**Precautionary Label** May cause skin, eye, and respiratory irritation. May cause sensitization by inhalation and skin contact. Always read Safety Material Data Sheet before use.

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Not Regulated.

**MARINE TRANSPORT (IMDG/IMO)**

**IMDG/IMO Shipping Name** Not Regulated.

**Marine Pollutant:** No

**15. Regulatory Information**

**Regulatory Information**

SARA 302 Extremely Hazardous Substances: None.

SARA Section 311/312: Acute, Chronic Health Hazard.

SARA 313 Toxic Chemicals: None.

CERCLA Reportable Quantity: None.

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**

CA=CIRCA NA=NOT AVAILABLE NE=NOT ESTABLISHED NR=NOT REGULATED NP= NOT APPLICABLE PR=PROPRIETARY TS=TRADE SECRET ?=UNKNOWN.

**Company Policy or Disclaimer**

The information contained in this MSDS is taken from sources believed to be accurate as of the date hereof; however Epoxy Systems, Inc. makes no expressed or implied warranty in respect to the accuracy of the information or the suitability of the recommendations, and assumes no liabilities to any user thereof.

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