

## Urethabond 313 Part B

**1 PRODUCT AND COMPANY IDENTIFICATION**

**Product Identifier:** Urethabond 313 Part B  
**Synonyms:** Urethabond 313 Pigmented Part B or Clear Part B  
**Common Name:** 1,6 Hexamethylene Diisocyanate Based Polyisocyanate  
**SDS Number:** I18  
**Revision Date:** 5/29/2015  
**Version:** 1  
**Chemical Family:** Aliphatic Isocyanate  
**Product Use:** Curing agent for Urethabond Urethanes  
**Supplier Details:** Coatings for Industry, Inc.  
 319 Township Line Road  
 Souderton, PA 18964  
**Emergency:** Infotrac  
**Contact:** USA: 1-800-535-5053 / International :352-323-3500  
**Phone:** 215-723-0919  
**Fax:** 215-723-0911  
**Email:** cs@cficoatings.com  
**Web:** www.cficoatings.com

**2 HAZARDS IDENTIFICATION****Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):**

Environmental, Hazards to the aquatic environment - Acute, 2  
 Environmental, Hazards to the aquatic environment - Acute, 3  
 Environmental, Hazards to the aquatic environment - Chronic, 3  
 Health, Serious Eye Damage/Eye Irritation, 1  
 Health, Respiratory or skin sensitization, 1 Skin  
 Health, Specific target organ toxicity - Single exposure, 3  
 Physical, Flammable Liquids, 3  
 Health, Carcinogenicity, 2  
 Health, Acute toxicity, 4 Inhalation

**GHS Label elements, including precautionary statements****GHS Signal Word: DANGER****GHS Hazard Pictograms:****GHS Hazard Statements:**

H401 - Toxic to aquatic life  
 H402 - Harmful to aquatic life  
 H412 - Harmful to aquatic life with long lasting effects  
 H318 - Causes serious eye damage  
 H317 - May cause an allergic skin reaction  
 H336 - May cause drowsiness or dizziness  
 H335 - May cause respiratory irritation  
 H226 - Flammable liquid and vapor  
 H351 - Suspected of causing cancer  
 H332 - Harmful if inhaled

**GHS Precautionary Statements:**

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P210 - Keep away from heat/sparks/open flames/hot surfaces. No smoking  
 P232 - Protect from moisture.  
 P241 - Use explosion-proof electrical/ventilating/light/equipment.  
 P243 - Take precautionary measures against static discharge.  
 P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.  
 P271 - Use only outdoors or in a well-ventilated area.  
 P272 - Contaminated work clothing should not be allowed out of the workplace.  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
 P302+352 - IF ON SKIN: Wash with soap and water.  
 P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
 P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.  
 P314 - Get Medical advice/attention if you feel unwell.  
 P333 - If skin irritation or a rash occurs: Get medical attention.  
 P363 - Wash contaminated clothing before reuse.  
 P403+233 - Store in a well ventilated place. Keep container tightly closed.  
 P501 - Dispose of contents/container in accordance with existing federal, state, and local environmental control laws.

<b>3</b>	<b>COMPOSITION/INFORMATION ON INGREDIENTS</b>
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**Ingredients:**

Cas#	%	Chemical Name
28182-81-2	70-80%	Hexane, 1,6-diisocyanato-, homopolymer
822-06-0	0.1-1%	Hexamethylene-1,6-diisocyanate
1330-20-7	3-7%	Xylene
123-86-4	15-25%	n-Butyl acetate
100-41-4	0-2%	Ethyl benzene

<b>4</b>	<b>FIRST AID MEASURES</b>
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**Inhalation:** Move to an area free from further exposure. Extreme asthmatic reactions that may occur in sensitized persons can be life threatening. Get immediate medical attention. Give oxygen or artificial respiration if needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours.

**Skin Contact:** Remove contaminated clothing and footwear immediately, and wash before reuse. Discard clothing and footwear which cannot be decontaminated.  
Wash with soap and water. Get medical attention if irritation develops and persists.

**Eye Contact:** Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Then remove contact lenses, if easily removeable, and continue irrigation for not less than 15 minutes. Get medical Attention if irritation develops.

**Ingestion:** Do NOT induce vomiting or attempt chemical neutralization. Rinse mouth with water. Never give anything by mouth to an unconscious person. Get prompt, qualified medical attention.

**Most Important Symptom(s)/Effect(s)**

**Acute:** Isocyanate 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.

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. Cured material is

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difficult to remove.

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

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

**Delayed:** Symptoms affecting the respiratory tract can also occur several hours after overexposure.

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**FIRE FIGHTING MEASURES**

<b>Flash Point:</b>	91.0° F. (33.0° C.)
<b>Flash Point Method:</b>	Setaflash
<b>LEL:</b>	0.8% (by volume) for the solvent
<b>UEL:</b>	7.6% (by volume) for the solvent

**Special Fire Fighting Procedures:**

Full emergency equipment with self contained breathing apparatus and full protective clothing should be worn by fire fighters. During a fire, HDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. (see Section VIII). Isolate from heat, electrical equipment, sparks and open flame. Closed container may explode when exposed to extreme heat or burst when contaminated with water (CO<sub>2</sub> evolved). Solvent vapors may be heavier than air. Stagnant air may cause vapors to accumulate and travel along the ground to an ignition source which may result in a flash back to the source of the vapors.

**Unusual Fire or Explosion Hazards:** Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO<sub>2</sub> 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.

**Extinguishing Media:** Dry chemical; carbon dioxide; foam; water spray for large fires.

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**ACCIDENTAL RELEASE MEASURES****Spill or leak procedures:**

Evacuate nonessential personnel. Remove all sources of ignition and ventilate the area. Notify appropriate authorities if necessary. Put on appropriate personal protective equipment (see Section 8). Dike or impound spilled material and control further spillage if feasible. Cover the spill with absorbent material (e.g. sawdust, vermiculite, kitty litter, fullers 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, allow to stand for 24 to 48 hours. Wash down spill area with decontamination solutions.

**Additional Spill Procedures/Neutralization**

Products or product mixtures that have been shown to be effective neutralization solutions for decontaminating surfaces, tools, or equipment that have been in contact with an isocyanate includes:

Products available through industrial suppliers:

- Spartan Chemical Company: 1-800-537-8990:

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- o Spartan® ShineLine Emulsifier Plus
- o Spartan® SC-200 Heavy Duty Cleaner
- Colorimetric Laboratories, Inc. (CLI): 1-847-803-3737
  - o Isocyanate Decontamination Solution
- Mix equal amounts of the following:
  - o Mineral spirits (80%), VM&P Naphtha (15%), and household detergent (5%), and
  - o A 50-50 mixture of monoethanolamine and water

In a separate container, blend the two solutions in a 1:1 ratio by volume. Immediately prior to applying this blended neutralization solution onto the contaminated surface area, mix or agitate the container to help ensure uniform mixing of the ingredients.

If the above products are not available, the following products can be obtained through retail outlets:

- ZEP® Commercial Heavy-Duty Floor Stripper
- Greased Lightning® Super Strength Cleaner and Degreaser
- EASY OFF® Grill and Oven Cleaner or EASY OFF® Fume Free Oven Cleaner
- A mixture of 50% Simple Green® Pro HD Heavy-Duty Cleaner and 50% household ammonia
- A mixture of 90% Fantastic® Heavy Duty All Purpose Cleaner and 10% household ammonia.

### Waste disposal method:

Waste must be disposed of in accordance with federal, state, and local environmental control regulations. Incineration is the preferred method. Empty containers must be handled with care due to product residue and flammable solvent vapor. Decontaminate containers prior to disposal. Do not heat or cut empty container with electric or gas torch.

<b>7</b>	<b>HANDLING AND STORAGE</b>
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#### Handling Precautions:

Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Consider normal working hygiene.  
 Do not expose containers to open flame, excessive heat, or direct sunlight.  
 Keep away from sources of ignition.  
 Keep material out of reach of children.  
 Wash clothing before reuse and decontaminate or discard contaminated shoes. Wash thoroughly after handling.

#### Storage Requirements:

Storage Temperature (min/max): -30° F. (-34° C)/122° F. (50° C)  
 Shelf Life: One year, if unopened  
 Special Sensitivity:  
 If container is exposed to high heat, it can be pressurized and possibly rupture explosively. HDI reacts slowly with water to form CO<sub>2</sub> gas. This gas can cause sealed containers to expand and possibly rupture explosively.  
 Handling/Storage Precautions:  
 Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. At maximum storage temperatures noted, material may slowly polymerize without hazard. Ideal storage temperature range for ease of handling is 50-81° F. (10-27° C.). Avoid contact with skin and eyes. Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard.

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<b>8</b>	<b>EXPOSURE CONTROLS/PERSONAL PROTECTION</b>
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**Engineering Controls:**

## Industrial Hygiene/Ventilation Measures

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.

**Personal Protective Equipment:**

## Respiratory Protection

A respirator that is recommended or approved for use in isocyanate-containing environments (air-purifying or fresh air-supplied) may be necessary for spray applications or other situations such as high temperature use which may produce inhalation exposures. A supplied-air respirator (either positive pressure or continuous flow-type) is recommended. Before an air-purifying respirator can be used, air monitoring must be performed to measure airborne concentrations of HDI monomer and HDI polyisocyanate. Specific conditions under which air-purifying respirators can be used are outlined in the following sections. Observe OSHA regulations for respirator use (29 CFR 1910.134).

**SPRAY APPLICATION:** A. 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/m<sup>3</sup> averaged over 8 hours or 10 mg/m<sup>3</sup> 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/m<sup>3</sup> averaged over 8 hours or 10 mg/m<sup>3</sup> averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits) and - a NIOSH-certified End of Service Life Indicator or a change schedule based upon objective information or data is used to ensure that cartridges are replaced before the end of their service life. In addition, prefilters should be changed whenever breathing resistance increases due to particulate buildup.

**NON-SPRAY OPERATIONS:** A. During non-spray operations such as mixing, batch-making, brush or roller application, etc., at elevated temperatures (for example, heating of material or application to a hot substrate), it is possible to be exposed to airborne isocyanate vapors. Therefore, when the coatings system will be applied in a non-spray manner, a supplied-air (either positive pressure or continuous flow-type) respirator is mandatory when ONE OR MORE of the following conditions exists: - the airborne isocyanate concentrations are not known; or - the airborne isocyanate monomer concentrations exceed 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); or - the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed 5 mg/m<sup>3</sup> averaged over 8 hours or 10 mg/m<sup>3</sup> 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 paint environments, and used in accordance with all recommendations made by the manufacturer, can be used when ALL of the following conditions are met: -the airborne concentrations of the isocyanate monomer are below 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); and - the airborne polyisocyanate (polymeric, oligomeric) concentrations are known to be below 5 mg/m<sup>3</sup> averaged over eight (8) hours or 10 mg/m<sup>3</sup> 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.

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Components with workplace control parameters

### Xylene (1330-20-7)

TWA 100 ppm (435 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

STEL 150 ppm (655 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

TWA 100 ppm (434 mg/m<sup>3</sup>) USA. ACGIH Threshold Limit Values (TLV)  
Not classifiable as a human carcinogen

STEL 150 ppm (651 mg/m<sup>3</sup>) USA. ACGIH Threshold Limit Values (TLV)  
Not classifiable as a human carcinogen

### n-Butyl acetate (123-86-4)

TWA 150 ppm USA. ACGIH Threshold Limit Values (TLV)  
Eye & Upper Respiratory Tract irritation

STEL 200 ppm USA. ACGIH Threshold Limit Values (TLV)  
Eye & Upper Respiratory Tract irritation

TWA 150 ppm (710 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

STEL 200 ppm (950 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

TWA 150 ppm (710 mg/m<sup>3</sup>) USA. NIOSH Recommended Exposure Limits

STEL 200 ppm (950 mg/m<sup>3</sup>) USA. NIOSH Recommended Exposure Limits

### Ethyl benzene (100-41-4)

TWA 20 ppm USA. ACGIH Threshold Limit Values (TLV)  
Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI section) Confirmed animal carcinogen with unknown relevance to humans

STEL 125 ppm USA. ACGIH Threshold Limit Values (TLV)  
Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI section) Confirmed animal carcinogen with unknown relevance to humans

TWA 100 ppm (435 mg/m<sup>3</sup>) USA. NIOSH Recommended Exposure Limits

STEL 125 ppm (545 mg/m<sup>3</sup>) USA. NIOSH Recommended Exposure Limits

TWA 100 ppm (435 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

STEL 125 ppm (545 mg/m<sup>3</sup>) USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

**Hexane, 1,6-diisocyanato-, homopolymer (28182-81-2) [85-97%]** : no data available



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**Hexamethylene-1,6-diisocyanate (822-06-0) [0.1-1%]:**

TWA 0.0050 ppm USA. ACGIH Threshold Limit Values (TLV)  
Upper Respiratory Tract irritation Respiratory sensitization

TWA 0.0050 ppm USA. NIOSH Recommended Exposure Limits  
0.035 mg/m<sup>3</sup>  
10 minute ceiling value

C 0.02 ppm USA. NIOSH Recommended Exposure Limits  
0.14 mg/m<sup>3</sup>  
10 minute ceiling value

**Propanoic acid, 3-ethoxy-, ethyl ester (763-69-9) [3-15%] : no data available**

**9 PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance:</b>	Clear to slightly yellow	<b>Odor:</b>	Solvent ester type odor
<b>Physical State:</b>	Liquid	<b>Solubility:</b>	Resin is insoluble - reacts slowly with water
<b>Spec Grav./Density:</b>	1.0 - 1.1 @ 68° F. (20° C.)	<b>Percent Volatile:</b>	By Volume: 25-30%
<b>Molecular weight:</b>	Approx. 500 (Polyisocyanate)	<b>Flash Point:</b>	91.0° F. (33.0° C.)
		<b>Auto-Ignition Temp:</b>	Approximately 400C (752F)

**10 STABILITY AND REACTIVITY**

<b>Chemical Stability:</b>	Product is stable under normal conditions.
<b>Conditions to Avoid:</b>	Heat, flames and sparks.
<b>Materials to Avoid:</b>	Water, Amines, Strong bases, Alcohols, Copper alloys
<b>Hazardous Decomposition:</b>	By Fire and High Heat: Carbon dioxide (CO <sub>2</sub> ), carbon monoxide (CO), oxides of nitrogen (NO <sub>x</sub> ), dense black smoke., Hydrogen cyanide, Isocyanate, Isocyanic Acid, Other undetermined compounds
<b>Hazardous Polymerization:</b>	May occur; contact with moisture or other materials which react with isocyanates or temperatures over 350° F. (177° C) may cause polymerization.

**11 TOXICOLOGICAL INFORMATION**

Likely Routes of Exposure:

Skin Contact, Inhalation, Eye Contact

Health Effects and Symptoms

Acute:

Isocyanate 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.

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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. Cured material is difficult to remove.

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

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

Chronic:

As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to isocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to isocyanates at levels well below the exposure limits or guidelines. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent.

Prolonged contact with skin can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with isocyanates can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Prolonged vapor contact with the eyes may cause conjunctivitis.

Delayed: Symptoms affecting the respiratory tract can also occur several hours after overexposure.

### **Hexane, 1,6-diisocyanato-, homopolymer (28182-81-2)**

Toxicity Note: Data is based on a similar product, including residual monomer.

Acute Oral Toxicity: LD50: > 5000 mg/kg (rat, female) (OECD Test Guideline 423)

Acute Inhalation Toxicity: LC50: 0.554 mg/l, 4 h (rat)

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Skin Irritation: rabbit, slight irritant

Eye Irritation: rabbit, slight irritant

Sensitization: Skin sensitisation according to Magnusson/Kligmann (maximizing test):: positive (guinea pig, OECD Test Guideline 406)

Repeated Dose Toxicity:

Subchronic inhalation toxicity, rat:

Test concentration - 0,4 ; 3,4 and 21,0 mg aerosol/m<sup>3</sup>exposure time - 13 weeks(6 hours a day, 5 days a week)3,4 mg/m<sup>3</sup> was tolerated without damage (NOEL),21,0 mg/m<sup>3</sup> caused increase of lung weight.No evidence of histopathological changes in the upper and central respiratory passages.Unspecific changes in the lower respiratory



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tract; these are attributed to the product's primary irritation potential. Evidence of damage to organs other than the organs of respiration was not found.

### Mutagenicity:

Genetic Toxicity in Vitro: Salmonella/microsome test (Ames test): No indication of mutagenic effects.

Genetic Toxicity in Vivo: Micronucleus test: negative (mouse)

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

Acute Oral Toxicity: LD50: 746 mg/kg (rat, male) (OECD Test Guideline 401)

Acute Inhalation Toxicity: LC50: 0.124 mg/l, 4 h (rat, male/female) (OECD Test Guideline 403)

Acute Dermal Toxicity: LD50: > 7000 mg/kg (rat, male/female) (OECD Test Guideline 402)

Skin Irritation: rabbit, OECD Test Guideline 404, Corrosive

Eye Irritation: rabbit, OECD Test Guideline 405, Corrosive

Sensitization: dermal: sensitizer (guinea pig, Maximisation Test (GPMT))

Other isocyanates have been shown to produce dermal and respiratory sensitization in several species (guinea pigs, mice, rabbits, dogs). In addition, there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur.

dermal: sensitizer (Human, Case Report)

Respiratory sensitization: sensitizer (guinea pig)

### Repeated Dose Toxicity

2 years, inhalation: NOAEL: < 0.005 ppm, LOAEL: 0.005 ppm, (rat, Male/Female, 6 hrs/day 5 days/week). Irritation to lungs and nasal cavity.

### Mutagenicity

Genetic Toxicity in Vitro: Salmonella/microsome test (Ames test): negative (Salmonella typhimurium, Metabolic Activation: with/without)

Point mutation in mammalian cells (HPRT test): negative (Metabolic Activation: with/without)

Genetic Toxicity in Vivo: Micronucleus test: negative (mouse, male/female, Inhalative)

### Carcinogenicity

rat, male/female, Inhalative, 2 yrs, 6 hours/day, 5 days/week, Did not show carcinogenic effects in animal experiments.

Toxicity to Reproduction/Fertility Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test, Inhalative, 6 hours/day 7 days/week, (rat, male/female) NOAEL (F2): 0.3 ppm Fertility and developmental toxicity tests did not reveal any effect on reproduction.

Developmental Toxicity/Teratogenicity: Rat, female, inhalation, gestation days 0 - 19, daily, NOAEL (teratogenicity): >0.3

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ppm, NOAEL (maternal): < 0.3 ppm No Teratogenic effects observed at doses tested.

No fetotoxicity observed at doses tested.

### Neurological Effects

Rats exposed by inhalation, 6 hours/day, for approximately 3 weeks, to concentrations as high as 0.3 ppm showed no neurobehavioral effects or damage to nerve tissues.

### Carcinogenicity:

No carcinogenic substances as defined by IARC, NTP and/or OSHA

### **n-Butyl acetate (123-86-4)**

#### Information on toxicological effects

##### Acute toxicity:

Oral LD50 LD50 Oral - rat - 10,700 - 14,130 mg/kg  
Inhalation LC50 LC50 Inhalation - rat - 4 h - > 21.0 mg/l  
Dermal LD50 LD50 Dermal - rabbit - 17,600 mg/kg  
Other information on acute toxicity no data available

Skin corrosion/irritation: Skin - rabbit - Skin irritation - 24 h

Serious eye damage/eye irritation: Eyes - rabbit - Moderate eye irritation

Respiratory or skin sensitisation: dermal: non-sensitizer (Guinea pig, Maximization Test) dermal: non-sensitizer (Human, Magnusson/Kligmann (Maximization Test))

##### Germ cell mutagenicity: Genetic Toxicity in Vitro:

Ames: negative (Salmonella typhimurium, Metabolic Activation: with/without)  
Cytogenetic assay: negative (other mammalian cell line, Metabolic Activation: without)  
Chromosome aberration test: negative (Chinese hamster lung cells, Metabolic Activation: without)

##### Carcinogenicity:

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.  
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.  
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Two-generation study, Inhalative, daily, (rat, male/female) NOAEL (parental): 750 ppm, NOAEL (F1): 750 ppm, NOAEL (F2): 750 ppm

Teratogenicity: Developmental Toxicity - rat - Inhalation: Rat, Female, inhalation, gestation days 1-16, 7 hrs/day, NOAEL (teratogenicity): 1,500 ppm, No Teratogenic effects observed at doses tested. rabbit, female, inhalation, gestation days 1-19, 7 hrs/day, NOAEL (teratogenicity): 1500 ppm, No Teratogenic effects observed at doses tested. Rat, Female, inhalation, 7 hrs/day, NOAEL (teratogenicity): 1,500 ppm, NOAEL (maternal): 1500 ppm

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Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System): May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Vapours may cause drowsiness and dizziness. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. Causes skin irritation. Eyes Causes eye irritation.

Signs and Symptoms of Exposure: Drowsiness, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects: no data available

Additional Information:

RTECS: AF7350000

### Xylene (mixed isomers) (1330-20-7)

Information on toxicological effects

Acute toxicity:

Oral LD50: (Rat) 4300 mg/kg

Inhalation LC50: (Rat, male, 4hr) 29.091mg/l (EU method B.2)

Dermal LD50: (Rabbit, male) >4400mg/kg

Other information on acute toxicity

Skin corrosion/irritation: (Rabbit, 24hr) irritating

Serious eye damage/eye irritation: Causes eye irritation

Respiratory or skin sensitization: no data available

Germ cell mutagenicity: Ames: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity:

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Ethylbenzene)

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Xylene)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Two-generation study, Inhalative, daily, (rat, male/female) NOAEL (parental): 500, NOAEL (F1): > 500, NOAEL (F2): > 500 No toxicity to reproduction

Teratogenicity: rat, female, inhalation, gestation days 9-14, 24 hrs/day, NOAEL (teratogenicity): > 230 ppm, NOAEL (maternal): > 230 ppm No Teratogenic effects observed at doses tested. rat, female, inhalation, gestation days 6-20, 6 hours/day, NOAEL (teratogenicity): > 8.684 mg/l, NOAEL (maternal): 2.171 mg/l, No Teratogenic effects observed at doses tested.

Specific target organ toxicity - single exposure (Globally Harmonized System): no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Ingestion May be harmful if swallowed. Skin Causes skin irritation. Eyes Causes eye irritation.

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## Urethabond 313 Part B

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Signs and Symptoms of Exposure: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects: no data available

Additional Information:

RTECS: Not available

### Ethyl benzene (100-41-4)

Information on toxicological effects

Acute toxicity:

Oral LD50: (Rat) 3500mg/kg

Inhalation LC50: (Rat, 2 hr) 5500mg/m<sup>3</sup>

Dermal LD50 (Rabbit) 15,433 mg/kg

Other information on acute toxicity

Skin corrosion/irritation: Draize, mild skin irritation

Serious eye damage/eye irritation: (Rabbit) Draize, severely irritating

Respiratory or skin sensitisation: dermal: non-sensitizer (Human, Patch Test)

Germ cell mutagenicity: Ames: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity:

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Ethylbenzene)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Teratogenicity: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System) :no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. Causes skin irritation. Eyes Causes eye irritation.

Signs and Symptoms of Exposure: Central nervous system depression, Nausea, Headache, Vomiting, Ataxia., Tremors

Synergistic effects: no data available

Additional Information:

RTECS: DA0700000

## Urethabond 313 Part B

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**ECOLOGICAL INFORMATION****n-Butyl acetate (123-86-4)**

Information on ecological effects

Toxicity:

Toxicity to fish LC50 - *Lepomis macrochirus* (Bluegill) - 100 mg/l - 96 h.

Toxicity to daphnia EC50 - *Daphnia magna* (Water flea) - 72.8 - 205.0 mg/l - 24 h.

and other aquatic invertebrates

Persistence and degradability: Biodegradation, aerobic, 98 %, Exposure time: 28 Days

Biochemical Oxygen Demand (BOD) 1,020 mg/g

Chemical Oxygen Demand (COD) 2,320 mg/g

Bioaccumulative potential: ca. 4 - 14 BCF

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life with long lasting effects.

**Hexane, 1,6-diisocyanato-, homopolymer (28182-81-2)**

Biodegradation: 1 %, Exposure time: 28 d, i.e. not readily degradable

Acute and Prolonged Toxicity to Fish: LC50: > 100 mg/l (*Danio rerio* (zebra fish), 96 h)

Acute Toxicity to Aquatic Invertebrates: EC50: > 100 mg/l (*Daphnia magna* (Water flea), 48 h)

Toxicity to Aquatic Plants: ErC50: > 100 mg/l, (*scenedesmus subspicatus*, 72 h)

Toxicity to Microorganisms: EC50: > 100 mg/l, (activated sludge, 3 h)

Additional Ecotoxicological Remarks: Data is based on a similar product, including residual monomer.

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

Biodegradation: aerobic, 42 %, Exposure time: 28 d, i.e. not readily degradable

Bioaccumulation: value calculated, 57.6 BCF

An accumulation in aquatic organisms is not to be expected. Value calculated, 3.2 BCF

An accumulation in aquatic organisms is not to be expected. Studies of hydrolysis products.

Acute and Prolonged Toxicity to Fish: LC0: >= 82.8 mg/l (*Danio rerio* (zebra fish), 96 h)

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## Urethabond 313 Part B

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Acute Toxicity to Aquatic Invertebrates: EC0:  $\geq$  89.1 mg/l (Daphnia magna (Water flea), 48 h)

Toxicity to Aquatic Plants: ErC50:  $>$  77.4 mg/l, (Desmodesmus subspicatus (Green algae), 72 h)

Toxicity to Microorganisms: EC50: 842 mg/l, (activated sludge, 3 h)

### **Xylene (mixed isomers) (1330-20-7) [3.5%]**

Information on ecological effects

Toxicity:

LC50: 13.5 - 17.3 mg/l (Rainbow (Donaldson) Trout (Oncorhynchus mykiss), 96 h)

Acute Toxicity to Aquatic Invertebrates: 600 ug/L (Gammarus sp., 48 h)

Toxicity to Aquatic Plants: EC50: 10 mg/l, End Point: growth (other: algae, 72 h)

Persistence and degradability:  $>$  60 %, Exposure time: 28 d, i.e. readily biodegradable

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

### **Ethyl benzene (100-41-4) [3.5%]**

Information on ecological effects

Toxicity:

Toxicity to fish LC50 - Cyprinodon variegatus (sheepshead minnow) - 88.00 mg/l - 96 h.

LC50 - Lepomis macrochirus (Bluegill) - 80.00 mg/l - 96 h

NOEC - Cyprinodon variegatus (sheepshead minnow) - 88 mg/l - 96 h

LC50 - Oncorhynchus mykiss (rainbow trout) - 4.2 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 2.90 mg/l - 48 h.

Persistence and degradability: no data available

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

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## **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. Empty containers must be handled with care due to product residue and flammable solvent vapor. Decontaminate containers prior to disposal. Do not heat or cut empty container with electric or gas torch.



**Urethabond 313 Part B**

<b>14</b>	<b>TRANSPORT INFORMATION</b>
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UN1263, Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base, 3, PGIII, (Polyisocyanate, Contains Xylene and Butyl Acetate)

Freight Class Bulk: Isocyanate

Freight Class Package: Chemicals, NOI, NMFC 60000

<b>15</b>	<b>REGULATORY INFORMATION</b>
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Component (CAS#) [%] - CODES

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Hexane, 1,6-diisocyanato-, homopolymer (28182-81-2) [70-80%] TSCA

RQ(100LBS), Hexamethylene-1,6-diisocyanate (822-06-0) [0.1-1%] CERCLA, HAP, MASS, SARA313, TSCA, TXAIR

RQ(100LBS), Xylene (1330-20-7) [3-7%] CERCLA, CSWHS, EPCRAWPC, HAP, MASS, NJHS, OSHAWAC, PA, SARA313, TOXICRCRA, TSCA, TXAIR, TXHWL

RQ(5000LBS), n-Butyl acetate (123-86-4) [15-25%] CERCLA, CSWHS, MASS, OSHAWAC, PA, TSCA, TXAIR

Ethyl benzene (100-41-4) [0-2%] CERCLA, CSWHS, EPCRAWPC, HAP, MASS, NJHS, OSHAWAC, PA, PRIPOL, SARA313, TOXICPOL, TSCA, TXAIR

Regulatory CODE Descriptions

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RQ = Reportable Quantity  
TSCA = Toxic Substances Control Act  
CERCLA = Superfund clean up substance  
HAP = Hazardous Air Pollutants  
MASS = MA Massachusetts Hazardous Substances List  
SARA313 = SARA Title III Toxic Chemicals  
TXAIR = TX Air Contaminants with Health Effects Screening Level  
CSWHS = Clean Water Act Hazardous substances  
EPCRAWPC = EPCRA Water Priority Chemicals  
NJHS = NJ Right-to-Know Hazardous Substances  
OSHA WAC = OSHA Workplace Air Contaminants  
PA = PA Right-To-Know List of Hazardous Substances  
TOXICRCRA = RCRA Toxic Hazardous Wastes (U-List)  
TXHWL = TX Hazardous Waste List  
PRIPOL = Clean Water Act Priority Pollutants  
TOXICPOL = Clean Water Act Toxic Pollutants

<b>16</b>	<b>OTHER INFORMATION</b>
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