

# SAFETY DATA SHEET

## 1. Identification

Forsch Polymer  
3025 S Wyandot St  
Englewood, CO. 80110  
USA

**TRANSPORTATION EMERGENCY**  
(303)-548-7716

**NON-EMERGENCY PHONE**  
(303)-322-9611

e-mail address of person responsible for this SDS  
[Bill@forschpolymer.com](mailto:Bill@forschpolymer.com)  
[James@forschpolymer.com](mailto:James@forschpolymer.com)  
[Holly@forschpolymer.com](mailto:Holly@forschpolymer.com)

Product name: ISO 490A  
Chemical Family: Aromatic Isocyanate  
Use: Di/polyisocyanate components for the production of polyurethanes

## 2. Hazards Identification

### GHS Classification

Acute toxicity (Inhalation):	Category 1
Specific target organ toxicity: Single exposure:	Category 3 (Respiratory system)
Respiratory sensitization:	Category 1
Skin Irritation:	Category 2
Skin sensitization:	Category 1
Eye irritation:	Category 2A
Carcinogenicity:	Category 2

### GHS Label Elements



Hazard pictograms:

Signal word:

Hazard statements:

Danger  
Fatal if inhaled.  
May cause respiratory irritation.  
May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
Causes skin irritation.  
May cause an allergic skin reaction.

Precautionary statements:

**Prevention:**

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Do not breathe dust, mist, gas, vapors or spray.

Wash skin and face thoroughly after handling.

Use only outdoors or in a well-ventilated area.

Contaminated work clothing must not be allowed out of the workplace.

Wear permeation resistant protective gloves and clothing. Wear eye and face protection.

In case of inadequate ventilation wear respiratory protection. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134) or regional standards. For additional details, see section 8 of the SDS.

**Response:**

IF ON SKIN: Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical attention.

IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical attention.

IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.

Immediately call a doctor or emergency medical facility (i.e., 911).

Take off contaminated clothing and wash before reuse.

**Storage:**

Store in a well-ventilated place.

Store locked up.

Keep container tightly closed.

**Disposal:**

Dispose of contents and container in accordance with existing federal, state, and local environmental control laws.

**3. Composition/Information on Ingredients**

**Hazardous Components**

The 2,4-TDI (CAS# 584-84-9) and the 2,6-TDI (CAS# 91-08-7) isomer mixture is known as Toluene Diisocyanate (CAS# 26471-62-5). For Regulatory and State Right to Know information on this product CAS# 26471-62-5 and its isomers 2,4-TDI and 2,6-TDI please refer to regulatory information section of this SDS.

<b>Wei2ht</b>	<b>Components</b>	<b>CAS-No.</b>	<b>Classification</b>
<b>Percent</b>			

Causes serious eye irritation.  
Suspected of causing cancer.

95 - 100%	2,4-Toluene Diisocyanate	584-84-9	Acute toxicity Category 1 Inhalation. Skin irritation Category 2. Eye irritation Category 2A. Respiratory sensitisation Category 1. Skin sensitisation Category 1. Carcinogenicity Category 2. Specific target organ toxicity - single exposure Category 3 Respiratory system.
1 - 5%	2,6-Toluene Diisocyanate	91-08-7	Acute toxicity Category 1 Inhalation. Skin irritation Category 2. Eye irritation Category 2A. Respiratory sensitisation Category 1. Skin sensitisation Category 1. Carcinogenicity Category 2. Specific target organ toxicity - single exposure Category 3 Respiratory system.

The specific chemical identity and/or exact percentage of component(s) have been withheld as a trade secret.

**4. First Aid Measures**

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

**Acute:** Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL 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.

Causes skin irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Causes serious eye irritation with symptoms of reddening, tearing, stinging, swelling, and burning. 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.

## **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 easily removable, and 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. If readily available, apply a polyglycol-based cleanser (e.g. Colorimetric Laboratories, Inc. (CLI) D-TAMT<sup>™</sup> Skin Cleanser) or corn oil. Wash with soap and warm water and pat dry. If a polyglycol-based cleanser is not available, wash with soap and warm water for 15 minutes. If available, use a wipe test pad to verify decontamination is complete (e.g. CLI SWYPET<sup>™</sup>). Get medical attention if irritation develops. Discard or wash contaminated clothing before reuse.

## **Inhalation**

Move to an area free from further exposure. 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. Extreme asthmatic reactions that may occur in sensitized persons can be life threatening.

## **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 as for contact dermatitis or thermal burn. 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.

## 5. Firefighting Measures

**Suitable Extinguishing Media:** Dry chemical, Carbon dioxide (CO<sub>2</sub>), Foam, water spray for large fires.

**Unsuitable Extinguishing Media:** High volume water jet

### Fire Fighting Procedure

Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

### Hazardous Decomposition Products

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

### Unusual Fire/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.

## 6. Accidental Release Measures

### Spill and Leak Procedures

Implement site emergency response plan. Evacuate non-emergency personnel. The magnitude of the evacuation depends upon the quantity released, site conditions, and the ambient temperature. Isolate the area and prevent access of unauthorized personnel. Notify management. Call CHEMTREC at 1-800-4249300 for assistance and advice.

Wear necessary personal protective equipment (PPE) as specified in the SDS or the site emergency response plan. Ventilate and remove ignition sources. Control the source of the leak. Contain the released material by damming, diking, retaining, or diverting into an appropriate containment area. Absorb or pump off as much of the spilled material as

possible. When using absorbent, completely 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. Shovel the absorbent material into an approved metal container (i.e., 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. Repeat application of absorbent material until all liquid has been removed from the surface. For spills involving a solid product, remove mechanically (sweep up, vacuum, shovel etc.) and collect and place into an approved metal container.

Decontaminate the spill surface area using a neutralization solution (see list of solutions on the SDS); scrubbing the surface with a broom or brush helps the decontamination solution to penetrate into porous surfaces. Wait at least 15 minutes after first application of the neutralization solution. Cover the area with absorbent material and shovel this into an approved metal container. Residual surface contamination can be checked using a wipe test pad to verify decontamination is complete (e.g. CLI Surface Swype™). If the wipe test pad demonstrates that isocyanate remains on the surface (red color on pad), repeat applications of neutralization solution, with scrubbing, followed by absorbent until the surface is decontaminated (no color change on wipe pad). Apply lid loosely to metal waste container (do not tighten the lid because carbon dioxide gas and heat can be generated from the neutralization process). With the lid still loosely in place, move the container 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 and any contaminated equipment (i.e., broom or brush) in accordance with existing federal, state and local regulations.

#### **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 include, but are not limited to:

- Colorimetric Laboratories, Inc. (CLI): 1-847-803-3737
  - Isocyanate Decontamination Solution
- Spartan Chemical Company: 1-800-537-8990
  - Spartan® ShineLine Emulsifier Plus (stripping solution)
  - Spartan® SC-200 Heavy Duty Cleaner
- ZEP Commercial Heavy Duty Floor Stripper

.A mixture of 90% water, 10% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10)

- A mixture of 75% water, 20% non-ionic surfactant, and 5% n-propanol

.A mixture of 80% water, 10% non-ionic surfactant, 5% isopropanol, 5% ammonium hydroxide

(household ammonia) Skin Dermal absorption possible

US. ACGIH Threshold Limit Values

Hazard Designation: A3 Confirmed animal carcinogen with unknown relevance to humans.

US. ACGIH Threshold Limit Values

Hazard Designation: Dermal sensitization

US. ACGIH Threshold Limit Values

Hazard Designation: Respiratory sensitization

### **2,6-Toluene Diisocyanate (91-08-7)**

US. ACGIH Threshold Limit Values

Time weighted average 0.001 ppm

US. ACGIH Threshold Limit Values

Short term exposure limit 0.005 ppm

US. ACGIH Threshold Limit Values

Skin Dermal absorption possible

US. ACGIH Threshold Limit Values

Hazard Designation: A3 Confirmed animal carcinogen with unknown relevance to humans.

US. ACGIH Threshold Limit Values

Hazard Designation: Dermal sensitization

US. ACGIH Threshold Limit Values

Hazard Designation: Respiratory sensitization

Any component which is listed in section 3 and is not listed in this section does not have a known ACGIH TLV, OSHA PEL or supplier recommended occupational exposure limit.

### **Industrial Hygiene/Ventilation Measures**

Local exhaust should be used to maintain levels below the TLV and PEL whenever diisocyanate is handled, processed, or spray-applied. At normal room temperatures (70 F) TDI levels quickly exceed the TLV or PEL unless properly ventilated. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, and others have developed sampling and analytical methods.

### **Respiratory Protection**

**At normal room temperatures, airborne TDI can exceed the ACGIH TLV-TWA; therefore, in inadequately ventilated environments, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be**

described in the written respirator program. Further, if an APR is selected, the airborne tools or equipment using a neutralization solution.

## 7. Handling and Storage

### Handling/Storage Precautions

Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

### Storage Period:

12 Months

### Storage Temperature

**Minimum:** 25 °C (77 °F)

**Maximum:** 35 °C (95 °F)

### Storage Conditions

Employee education and training in the safe use and handling of this product are required under the OSHA

Hazard Communication Standard 29 CFR 1910.1200. Store separate from food products.

### Substances to Avoid

Water, Amines, Strong bases, Alcohols, Copper alloys

## 8. Exposure Controls/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.

### Exposure Limits

The sum of the 2,4 and 2,6 isomer concentration should not exceed the guideline limits.

### 2,4-Toluene Diisocyanate (584-84-9)

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)



Ceiling Limit Value 0.02 ppm, 0.14 mg/m<sup>3</sup>

US. ACGIH Threshold Limit Values  
Short term exposure limit 0.005 ppm

US. ACGIH Threshold Limit Values  
Time weighted average 0.001 ppm

US. ACGIH Threshold Limit Values

diisocyanate concentration must be no greater than 10 times the TLV or PEL. An organic vapor (OV) cartridge is recommended for APR use.

### **Hand Protection**

Ensure gloves remain in good condition during use and replace if any deterioration is observed.

Gloves should be worn. Nitrile rubber showed excellent resistance. Butyl rubber, neoprene, and PVC are also effective.

### **Eye Protection**

When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

### **Skin Protection**

**Avoid** all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., Animal tests and other research indicate that skin contact with TDI can play a role in causing isocyanate sensitization and respiratory reaction., This data reinforces the need to prevent direct skin contact with isocyanates.

### **Medical Surveillance**

All applicants 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.

### **Additional Protective Measures**

Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

## 9. Physical and Chemical Properties

<b>State of Matter:</b>	<b>solid</b>
<b>Color:</b>	<b>Colorless to light yellow</b>
<b>Odor:</b>	<b>pungent, strong</b>
<b>Odor Threshold:</b>	<b>No data available</b>
<b>pH:</b>	<b>No data available</b>
<b>Melting Point:</b>	<b>21 °C (69.8 °F) @ 1,013 hPa (DIN 53175)</b>
<b>Boiling Point:</b>	<b>252-254 °C (485-6-489.2 °F) @ 1,011 hPa</b>
<b>Flash Point:</b>	<b>131 °C (267.8°F) @ 1,013 hPa (DIN EN 22719)</b>
<b>Evaporation Rate:</b>	<b>No Data available</b>
<b>Flammability:</b>	<b>No Data available</b>
<b>Lower Explosion Limit:</b>	<b>0.9% (V)</b>
<b>Upper Explosion Limit:</b>	<b>9.5% (V)</b>
<b>Vapor Pressure:</b>	<b>approx.. 0.025 mmHg @ 25 °C (77 °F)</b>
<b>Vapor Density:</b>	<b>No Data Available</b>
<b>Density:</b>	<b>1.21 g/cm<sup>3</sup> @ 25 °C (77 °F) (DIN 51757)</b>
<b>Relative Vapor Density:</b>	<b>No Data Available</b>
<b>Specific Gravity:</b>	<b>1.22 @ 25 °C (77 °F)</b>
<b>Solubility in Water:</b>	<b>Insoluble - Reacts slowly with water to liberate CO<sub>2</sub> gas 0.124 g/l @ 25 °C (77 °F)</b>
<b>Partition Coefficient: n-octanol/water: logPow:</b>	<b>3.43 @ 22 °C (71.6 °F)</b>
<b>Auto-ignition Temperature:</b>	<b>&gt; 620 °C (1,148 °F) (DIN 51794)</b>
<b>Decomposition Temperature:</b>	<b>ca. 246 °C (474.8 °F)</b>
<b>Dynamic Viscosity:</b>	<b>ca. 3 mPa.s @ 25 °C (77 °F) (DIN EN ISO 12058)</b>
<b>Kinematic Viscosity:</b>	<b>2.235 mm<sup>2</sup>/s @ 21 °C (69.8 °F)</b>
<b>Bulk Density:</b>	<b>1,220 kg/m<sup>3</sup></b>

## 10. Stability and Reactivity

### Hazardous Reactions

Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization

#### **Materials to Avoid**

Water, Amines, Strong bases, Alcohols, Copper alloys

#### **Hazardous Decomposition Products**

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

### **11. Toxicological Information**

**Likely Routes of Exposure:** Inhalation  
Skin Contact  
Eye Contact

#### **Health Effects and Symptoms**

**Acute:** Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL 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.

Causes skin irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Causes serious eye irritation with symptoms of reddening, tearing, stinging, swelling, and burning. 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 diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. 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 TDI can play a role in causing isocyanate sensitization and respiratory reaction.

Prolonged vapor contact with eyes may cause conjunctivitis.

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

#### **Toxicity Data for: ISO 490A**

Toxicity data is for mixed isomers

#### **Acute Oral Toxicity**

LD50: 4,130 mg/kg (rat, female)

LD50: 5,110 mg/kg (rat, male)

#### **Acute Inhalation Toxicity**

LC50: 66 ppm, 1 h(rat)

#### **Acute Dermal Toxicity**

LD50: > 9,400 mg/kg (rabbit)

#### **Skin Irritation**

rabbit, Draize, Exposure Time: 24 h, Moderately irritating

#### **Eye Irritation**

rabbit, severe irritant

#### **Sensitization**

Skin sensitization (local lymph node assay (LLNA)):: positive (Mouse, OECD Test Guideline 429)

inhalation: sensitizer (Guinea pig, Other method)

#### **Repeated Dose Toxicity**

113 weeks, Inhalation: NOAEL: 0.05 ppm, (rat, Male/Female, 6 hrs/day 5 days/week)

Irritation to lungs and nasal cavity.No systemic effects were observed.

90 day, Oral: NOAEL: 30 mg/kg, LOAEL: 60 mg/kg, (rat, Male/Female, 5 days/week) Reduced body weight gain.Changes in lungs.

#### **Mutagenicity**

Genetic Toxicity in Vitro:

Ames: positive, negative (Salmonella typhimurium, Metabolic Activation: with/without)

Positive and negative results were seen in various in vitro studies. Questionable validity of studies due to

rapid hydrolysis in solvents.

Genetic Toxicity in Vivo:

Micronucleus Assay: negative (rat, )

Micronucleus test: negative (Mouse, male/female, Inhalative)

#### **Carcinogenicity**

rat, Male/Female, inhalation, 113 w, 6 hrs/day 5 days/week

negative

rat, Male/Female, oral, 106 w, daily

Positive, however the study validity is questioned due to the dose exceeding maximum tolerated dose and

irregularities in compound storage and analysis.

#### **Toxicity to Reproduction/Fertility**

Two generation study, inhalation, 6 lirs/clay 7 days/week, (rat) NOEL (parental): 0.08 ppm, NOEL (F1): 0.02 ppm, NOEL (F2): 0.3 ppm

No effects on Reproductive parameters observed at doses tested.

#### **Developmental Toxicity/Teratogenicity**

rat, female, inhalation, gestation days 6-15, 6 hrs/day 7 days/week, NOEL (teratogenicity): 0.1 ppm,

NOEL (maternal): 0.1 ppm

No Teratogenic effects observed at doses tested., Fetotoxicity seen only with maternal toxicity.

**The components in this product are either not classified, below the relevant concentration limits, or do not have any toxicity data associated with them.**

#### **Carcinogenicity:**

NTP and IARC evaluated TDI as a mixture of the 2,4 and 2,6 isomers.

#### **2,4-Toluene Diisocyanate**

NTP - Hazard Designation: Reasonably Anticipated to be a Human Carcinogen.

[ARC - Overall evaluation: 2B Possibly carcinogenic to humans.

#### **2,6-Toluene Diisocyanate**

NTP - Hazard Designation: Reasonably Anticipated to be a Human Carcinogen.

IARC - Overall evaluation: 2B Possibly carcinogenic to humans.

## 12. Ecological Information

### **Ecological Data for: ISO 490A**

Ecotoxicity data is for mixed isomers

### **Biodegradation**

0 %, Exposure time: 28 d

Not readily biodegradable.

### **Bioaccumulation**

Cyprinus carpio (Carp), Exposure time: 56 d, < 1 BCF

Not expected to bio-accumulate.

### **Acute and Prolonged Toxicity to Fish**

LC50: > 100 mg/1(Danio rerio (zebra fish), 96 h)

LC50: 133 mg/1 (Rainbow (Donaldson)Trout (Oncorhynchus mykiss), 96 h)

### **Acute Toxicity to Aquatic Invertebrates**

EC50: 12.5 mg/1 (Water flea (Daphnia magna), 48 h)

EC50: > 500 mg/1 (Grass shrimp, 24 h)

### **Toxicity to Aquatic Plants**

EC50: 3,230 - 4,300 mg/1, End Point: growth (other: algae,96 h)

### **Toxicity to Microorganisms**

EC50: > 100 mg/1, (Activated sludge microorganisms, 3 h)

**The components in this product are either not classified, below the relevant concentration limits, or do not have any ecotoxicity data.**

## 13. Disposal Considerations

### **Waste Disposal Method**

Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Incineration is the preferred method.

### **Empty Container Precautions**

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

#### 14. Transportation Information

##### Land transport (DOT)

**Proper Shipping Name:** Toluene diisocyanate  
**Hazard Class or Division:** 6.1  
**UN/NA Number:** 6.1  
**Packaging Group: Hazard Label(s):** UN2078

##### RSPA/DOT Regulated Components:

2,4-Toluene Diisocyanate

2,6-Toluene Diisocyanate

**Reportable Quantity:** 45 kg (99 lb)

##### Sea transport (IMDG)

**Proper Shipping Name:** TOLUENE DIISOCYANATE  
**Hazard Class or Division:** 6.1

**UN number:** UN2078

**Packaging Group:** II

**Hazard Label(s):** TOXIC

##### Air transport (ICAO/IATA)

**Proper Shipping Name:** Toluene diisocyanate

**Hazard Class or Division:** 6.1

**UN number:** UN2078

**Packaging Group:** II

**Hazard Label(s):** TOXIC

#### 15. Regulatory Information

##### United States Federal Regulations

**US. Toxic Substances Control Act:** Listed on the TSCA Inventory.

The following substance (s) is/are subject to TSCA 12(b) export notification requirements:

Components	# CAS	Threshold
2,4-Toluene Diisocyanate	584-84-9	>= 0.1 %
2,6-Toluene Diisocyanate	91-08-7	>= 0.1 %

**SNUR Components**

2,4-Toluene Diisocyanate 584-84-9      40CFR 721.10789  
40CFR 721.10789

**US. EPA CERCLA Hazardous Substances (40 CFR 302) Components:**

2,4-Toluene Diisocyanate      Reportable quantity: 100 lbs

2,6-Toluene Diisocyanate      Reportable quantity: 100 lbs

**SARA Section 311/312 Hazard Categories:**

Acute Health Hazard

Chronic Health Hazard

Reactivity Hazard

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA)  
SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355,  
Appendix A) Components:**

2,4-Toluene Diisocyanate

2,6-Toluene Diisocyanate

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA)  
SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier  
Notification Required Components: 2,4-Toluene Diisocyanate**

2,6-Toluene Diisocyanate

**US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of  
Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):**

Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

**State Right-To-Know Information**

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

**Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:**

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
>=95%	2,4-Toluene Diisocyanate	584-84-9
<=2%	2,6-Toluene Diisocyanate	91-08-7

**New Jersey Environmental Hazardous Substances List and/or New Jersey RTK  
Special Hazardous Substances Lists:**



<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
>=95%	2,4-Toluene Diisocyanate	584-84-9
<=2%	2,6-Toluene Diisocyanate	91-08-7

**Pennsylvania Right to Know Special Hazard Substance List:**

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
>=95%	2,4-Toluene Diisocyanate	584-84-9

**Massachusetts Right to Know Extraordinarily Hazardous Substance List:**

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
>=95%	2,4-Toluene Diisocyanate	584-84-9
<=2%	2,6-Toluene Diisocyanate	91-08-7

**California Prop. 65:**

Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

<u>Weight percent</u>	<u>Components</u>	<u>CAS-No.</u>
>=95%	2,4-Toluene Diisocyanate	584-84-9
<=2%	2,6-Toluene Diisocyanate	<b>91-08-7</b>

**CFATS (Chemical Facility Anti-Terrorism Standards) Chemicals**

To the best of our knowledge, this product does not contain Appendix A Chemicals of Interest (COI), at or above the Screening Threshold Quantity (STQ), as defined by the Department of Homeland Security Chemical Facility Anti-terrorism Standard (CFATS, 6 CFR Part 27.

Based on information provided by our suppliers, this product is considered "DRC Conflict Free" as defined by the SEC Conflict Minerals Final Rule (Release No. 34-67716; File No. S7-40-10; Date: 2012-08-22).

**16. Other Information**

The method of hazard communication for ISO 490A is comprised of product labels and safety data sheets. Safety data sheets for all of our products and general product declarations are available at [www.forschpolymer.com](http://www.forschpolymer.com)

The handling of products containing reactive TDI polyisocyanate/prepolymer and/or monomeric TDI requires appropriate protective measures referred to in this SDS. These products are therefore recommended only for use in industrial or trade (commercial) applications. They are not suitable for use in Do-It-Yourself applications.

Toluene diisocyanate (TDI) has a Significant New Use Rule (SNUR) which limits the ability of this chemical to be used in a consumer product. See 40CFR721.10789 for the regulatory restrictions. Any use outside of the use restrictions will require a submission of a Significant New Use Notice (SNUN), as listed under 40CFR721.25.

Information contained in this SDS is believed to be accurate but is furnished without warranty, express or implied, including warranties of merchantability or fitness for a particular purpose. The information relates only to the specific material designated herein. Forsch Polymer assumes no legal responsibility for use of or reliance upon the information in this SDS and such information shall in no case be considered a part of our terms and conditions of sale. The user is responsible for determining whether the Forsch Polymer product is suitable for user's method of use or application. Forsch Polymer is not liable for any failure to observe the precautionary measures described in this SDS or for any misuse of the produ