MATERIAL SAFETY DATA SHEET

ADDOLINK TT  44C/528S

RHEIN CHEMIE CORPORATION
145 Parker Court
Chardon, OH  44024

TRANSPORTATION EMERGENCY
CALL CHEMTREC........ : (800) 424-9300
INTERNATIONAL .......... : (703) 527-3887

NON-TRANSPORTATION
RCC EMERGENCY PHONE   : (440) 285-3547
RCC INFORMATION PHONE: (800) 289-2436

Section 1: Product and Company Identification

Product Name: ADDOLINK TT  44C/528S
Article Number: 2255514
Chemical Family: Aromatic Polyisocyanate
Chemical Name: Dimeric 2,4-Toluene Diisocyanate
Product Use: Thermoplastic Polyurethane Applications

Section 2: Composition/Information on Ingredients

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient Name/CAS Number</th>
<th>Exposure Limits</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene Diisocyanate Dimer 26747-90-0</td>
<td>OSHA (PEL): Not Established ACGIH (TLV): Not Established</td>
<td>95% 0%</td>
</tr>
<tr>
<td>2,4-Toluene Diisocyanate Monomer (TDI) 584-84-9</td>
<td>OSHA (PEL): 0.14 mg/m3 CEIL 0.02 ppm CEIL ACGIH (TLV): 0.14 mg/m3 STEL 0.02 ppm STEL 0.036 mg/m3 TWA 0.005 ppm TWA</td>
<td>0% 1%</td>
</tr>
</tbody>
</table>

OTHER INGREDIENTS
The following potentially hazardous chemical(s) are contained at levels below OSHA reporting requirements, but may be released during processing.
Material Name: ADDOLINK TT 44C/528S  
Article Number: 2255514

<table>
<thead>
<tr>
<th>Ingredient Name/ CAS Number</th>
<th>Exposure Limits</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Dioxide (Amorphous)</td>
<td>OSHA (PEL): 6.00 mg/m³ TWA</td>
<td>0% - 0.2%</td>
</tr>
<tr>
<td></td>
<td>ACGIH (TLV): 10.00 mg/m³ TWA</td>
<td></td>
</tr>
</tbody>
</table>

**Section 3: Hazards Identification**

**EMERGENCY OVERVIEW**


Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Causes eye irritation. Harmful if swallowed. May cause lung damage. Ground containers and equipment before transferring to avoid static sparks. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Reaction with water or foam can be vigorous. Use water as fog or mist; solid streams may spread fire. Toxic gases/fumes are given off during burning or thermal decomposition. Closed container may explode under extreme heat.

**POTENTIAL HEALTH EFFECTS**

**Route(s) of Entry:** Inhalation, Skin Contact

**HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE**

**Inhalation Hazards**

Acute Inhalation Hazards: TDI dust, vapors or mist at concentrations above the TLV 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 exposure limit with similar symptoms as well as asthma attack. Exposure to high vapor concentrations may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills) has also been reported. These symptoms can be delayed up to several hours after exposure.

Chronic Inhalation Hazards: As a result of previous repeated overexposures or a single large dose, certain individuals may develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the suggested exposure limit. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma attack, could be immediate or delayed (up to several hours after exposure). 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. Chronic overexposure to isocyanate has also been reported to cause lung damage (including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent. There has been a preliminary report on a possible new finding on sensitization. A TDI manufacturer, BASF, reported that 15 out of 269 TDI production employees developed asthma-like reactions attributed to TDI exposure. They indicated that the number of employees experiencing these reactions (about 1% per year) is not unusual. What is unusual is that 7 out of 15 individuals had experienced prior exposures to respiratory irritants, such as phosgene and chlorine, and this may have led to an increased risk of sensitization to TDI. Chlorine and phosgene are used in the synthesis of TDI and are not expected to be present in user facilities.*


**Skin Hazards**

**Acute Skin Hazards:**
Isocyanates react with skin protein and moisture and can cause irritation which may include the following symptoms: reddening, swelling, rash, scaling, or blistering. Cured material is difficult to remove.

**Chronic Skin Hazards:**
Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases, skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapors.

**Eye Hazards**

**Acute Eye Hazards:**
Dust, liquid, aerosols or vapors are severely irritating and can cause pain, tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However, damage is usually reversible. See First Aid Section for treatment.

**Chronic Eye Hazards:**
Repeated and/or prolonged exposures may result in adverse eye effects such as conjunctivitis or corneal damage.

**Ingestion Hazards**

**Acute Ingestion Hazards:**
Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.

**Chronic Ingestion Hazards:**
None reported for the product.

**Carcinogenic Effects:**
No carcinogenic activity was observed in lifetime inhalation studies in rats and mice (International Isocyanate Institute).

**Carcinogenic Components:**

**NTP:**
2,4-Toluene Diisocyanate Monomer (TDI): Classified as an NTP Anticipated Human Carcinogen - "Substances or groups of substances that may reasonably be anticipated to be carcinogens."

**IARC:**
2,4-Toluene Diisocyanate Monomer (TDI): Classified as IARC Possible Human Carcinogen (Group 2B) - "The chemical or group of chemicals is possibly carcinogenic for humans."

**OSHA:**
2,4-Toluene Diisocyanate Monomer (TDI): Not regulated
Medical Conditions Aggravated by Exposure:
May aggravate asthma., May aggravate respiratory disorders., May aggravate skin conditions., May aggravate skin allergies.

Human Health Effects Postnote:
PRODUCT AS A WHOLE: Mechanical irritation can be produced if this product is introduced into the eye. Small quantities of isocyanates (TDI) may be released when drums are opened for the first time. Air sampling on similar products has shown these levels to be below the suggested exposure limit. If this product is heated at temperatures greater than 212 F (100 C), slow decomposition takes place in which TDI is liberated. If this material is heated above 350 F (177 C) (i.e. during thermal processing), a significant increase in TDI vapors may be generated. Results from air-sampling on similar products show that TDI concentrations which exceed the suggested exposure limit may be present during thermal processing.

Section 4: First Aid Measures

First Aid for Eye:
In case of contact, flush eyes with large quantities of water for at least 15 minutes. The eyelids should be held apart during irrigation to ensure thorough flushing of all eye tissue. Call a physician immediately.

First Aid for Skin:
Immediately remove contaminated clothing and shoes. In case of skin contact, wash affected areas with soap and water. Get medical attention if irritation develops or persists. Wash clothing and clean shoes before reuse.

First Aid for Inhalation:
If inhaled, remove to fresh air. If breathing is difficult, give oxygen. Call a physician. If not breathing, give artificial respiration.

First Aid for Ingestion:
Call a physician immediately. Give victim one or two glasses of water or milk. If material is ingested, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Should vomiting occur, keep patients head below hip level to prevent aspiration of fluid into the lungs.

First Aid Other:
Wash affected areas for at least 15 minutes. To remove from skin, a tincture of green soap and water may also be used. For severe exposures, get under safety shower after removing clothing, then get medical attention. Asthmatic type symptoms may develop and may be immediate or delayed up to several hours. If ingested, add some activated carbon to the liquids.

Note to Physician:
Treat symptomatically. EYES: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. Skin: TDI is a known skin sensitizer. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the product. Respiratory: TDI is a known pulmonary sensitizer. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.
Section 5: Fire Fighting Measures

Flash Point: Not Applicable

Flammable Limits:

- Upper Explosion Limit (UEL %): Not Established
- Lower Explosion Limit (LEL %): Not Established

Auto-ignition Temperature: > 932 °F (> 500 °C)

Extinguishing Media:

- Suitable: Carbon Dioxide, Dry Chemical, Foam, Water spray for large fires.

Special Fire Fighting Procedures:

- Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. No skin surface should be exposed. At temperatures greater than 212°F (100°C), slow decomposition occurs and TDI is liberated. During a fire, irritating and toxic gases may be generated by thermal decomposition or combustion. Liberation of substantially more TDI vapors may occur at temperatures above 350°F (177°C). Use cold water spray to cool fire exposed containers. At these higher temperatures, TDI forms carbodiimides with the release of CO2 which can cause pressure build-up in closed containers. Containers can build up pressure and may rupture when exposed to extreme heat.

Unusual Fire/Explosion Hazards:

- Hot TDI can react vigorously with water or foam. Ground equipment when emptying or transferring material due to the potential for electrostatic build up. Vapors may form explosive mixtures with air.

Section 6: Accidental Release Measures

Spill or Leak Procedures:

- Evacuate area of all persons not wearing proper protective equipment; if indoors, ventilate area to maximum extent possible; if product is on the ground, dike area to prevent entry into water system; wear full protective equipment, including respiratory equipment during clean-up. (See Protective Equipment Section).
- Major Spill or Leak (10 gallons or more): Call CHEMTREC at 800-424-9300 for assistance and advice. If temporary control of isocyanate vapor is required, a blanket of protein foam (available at most fire departments) may be spread. Released product may be pumped into closed, but not sealed, container for disposal. Minor Spill or Leak (less than 10 gallons): Absorb isocyanate with sawdust or other absorbent, place in suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution.

Neutralization Chemicals:

1. Colorimetric Laboratories Inc. (CLI) decontamination solution.
2. A mixture of 75% water, 20% alkoxylated linear alcohol (e.g. Olin’s Poly-Tergent SL-62) and 5% n-propanol.
3. A mixture of 75% water, 20% Tergitol TMN-10 and 5% n-propanol. A mixture of 90% water, 8% ammonium hydroxide and 2% liquid detergent has...
also been used effectively. Add about 10 parts of neutralizer per one part of isocyanate, with mixing.

**Other Accidental Release Notes:**
Rhein Chemie requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

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**Section 7: Handling and Storage**

**Storage Temperature:** Store at ambient conditions

**Shelf Life:** Not Established

**Special Sensitivity:** If container is exposed to high heat, 350°F (177°C), it can be pressurized and possibly rupture. TDI reacts slowly with water to form polyureas and liberates CO2 gas. This gas can cause sealed containers to expand and possibly rupture.

**Handling/Storage Precautions:** Store in a dry place away from excessive heat. Do not reseal container if contamination is suspected. Prevent all contact. Do not breath dust, vapors or mist. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic 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. Exposure to vapors of heated TDI can be extremely dangerous. All handling equipment should be properly grounded to prevent the build-up of electrostatic charges. Handle in accordance with good industrial hygiene and safety practices.

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**Section 8: Exposure Controls/Personal Protection**

**Personal Protection Equipment**

**Eye Protection Requirements:** Chemical safety goggles, full-face shield., Contact lenses should not be worn., If vapor exposure is causing irritation, use a full-face, air-supplied respirator.

**Skin Protection Requirements:** Chemically resistant gloves recommended (neoprene)., However, please note that PVA degrades in water., Cover as much of the exposed skin area as possible with appropriate clothing, coveralls, apron and boots., If skin creams are used, keep the area covered by the cream to a minimum.

**Ventilation Requirements:** Use local exhaust ventilation if dusting or misting is a problem, to maintain air levels below the recommended exposure limit. Standard reference sources regarding industrial ventilation (i.e., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation. At normal room temperatures (70°F) TDI levels
quickly exceed the TLV unless properly ventilated.

**Respirator Requirements:** A supplied air respirator (either positive pressure or continuous flow type) is required. An approved, positive pressure air-supplied respirator is required whenever isocyanate concentrations are not known or exceed the suggested exposure limits listed in Section 2. Isocyanates have poor warning properties, since the odor at which they can be smelled is substantially higher than 0.005 ppm. Observe OSHA regulations for respirator use (29 CFR 1910.134.)

**Monitoring Requirements:** Isocyanate exposure levels must be monitored by accepted monitoring techniques to ensure that the suggested exposure limit is not exceeded. See Volume 1 (Chapter 17) and Volume 3 (Chapter 3) in Patty's Industrial Hygiene and Toxicology for sampling strategy.

**Medical Surveillance:** Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to isocyanates, no further exposure can be permitted.

**Additional Protective Measures:** Emergency showers and eye wash stations should be available. Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees on the safe use and handling of this product.

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**Section 9: Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Powder</td>
</tr>
<tr>
<td>Color</td>
<td>White to Yellowish</td>
</tr>
<tr>
<td>Odor</td>
<td>Aromatic, Slight Odor</td>
</tr>
<tr>
<td>pH</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>&gt; 293 °F (&gt; 145 °C)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.48 @ 68 °F (20 °C)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not Applicable</td>
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<tr>
<td>Vapor Pressure</td>
<td>Not Applicable</td>
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<tr>
<td>Vapor Density</td>
<td>Not Established</td>
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</table>

**Section 10: Stability and Reactivity**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>May occur Contact with moisture, other materials which react with isocyanates may cause polymerization., At temperatures greater than 212 F (100 C), slow decomposition takes place which liberates TDI., At temperatures over 350 F (177 C), a significant increase in TDI</td>
</tr>
</tbody>
</table>
vapors may be generated.

**Substances to Avoid:** Water, amines, strong bases, alcohols., Will cause some corrosion to copper alloys and aluminum., Reacts with water to form heat, CO2 and insoluble ureas.

**Conditions to Avoid:** Avoid contact with water and high temperatures.

**Decomposition Temperature:** > 212 °F (> 100 °C)

**Decomposition Products:** By fire and/or thermal decomposition: oxides of carbon, oxides of nitrogen, traces of hydrogen cyanide (HCN), TDI vapors and mist, and other undetermined aliphatic fragments.

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**Section 11: Toxicological Information**

**Toxicity Data for ADDOLINK TT 44C/528S**

Toxicity Note: No data available for this product.

**Toxicity Data for Toluene Diisocyanate Dimer**

**Acute oral toxicity:** LD50 = > 5,000 mg/kg (Rat)

**Toxicity Data for 2,4-Toluene Diisocyanate Monomer (TDI)**

Toxicity Note: Data is for Toluene Diisocyanate mixed isomers

**Acute oral toxicity:**
- LD50 = 5,110 mg/kg (Male Rat)
- LD50 = 4,130 mg/kg (Female Rat)
- LD50 = 4,130 mg/kg (Male mouse)
- LD50 = 5,260 mg/kg (Female mouse)

**Acute dermal toxicity:**
- LD50 = > 10,000 mg/kg (Rabbit)

**Acute inhalation toxicity:**
- 480 mg/m³, 1 hrs, (Rat)
- 350 mg/m³, 4 hrs, (Male Rat)
- 360 mg/m³, 4 hrs, (Female Rat)
- 138 mg/m³, 6 hrs, (Male mouse)
- 103 mg/m³, 6 hrs, (Female mouse)
- 80 mg/m³, 4 hrs, (Rabbit)
- 92 mg/m³, 4 hrs, (Guinea pig)

**Eye Irritation:** Severely irritating (Rabbit)

**Skin Irritation:** Moderately irritating Draize score = 3.6 (Rabbit)

Moderately irritating Draize score = 4.1 Standard Draize Test
**Sensitization:**
Positive. (Guinea pig) Dermal Cross sensitization with MDI.
Positive. (Guinea pig) Inhalation Cross sensitization with MDI.
Positive. (Rat) Dermal
Positive. (Mouse) Dermal Cross sensitization with MDI, HDI and HMDI.

**Repeated Dose Toxicity:**
Subchronic inhalation toxicity studies (doses of 0.1 - 1.5 ppm; 0.73 - 10.9 mg/m3) using rats, rabbits, guinea pigs, and dogs have shown that the effects of TDI via inhalation exposure are limited to the nasal passages and the pulmonary system. Pathological findings were rhinitis, bronchitis, bronchopneumonia, pneumonitis, pneumonia, mild congestion of the trachea, tracheitis, thick mucous plugs in bronchial branches. The LOEL = 0.1 ppm (0.73 mg/m3), based on bronchitis and bronchopneumonia.

**Carcinogenicity:**
No tumors were observed in carcinogenicity studies in which mice and rats were exposed to TDI via inhalation (doses of 0.05 and 0.15 ppm; 0.36 and 1.1 mg/m3; 10 and 30 times, respectively, the TLV for an 8-hr exposure). In carcinogenicity studies in which mice and rats were dosed via gavage (Rats: 0, 30, and 60 mg/kg for males, and 0, 60, and 120 mg/kg for females; Mice: 0, 120, and 240 mg/kg for males, and 0, 60, and 120 mg/kg for females), TDI caused an increase in the spontaneous tumor rate with both species for the following tumors: Rats (males and/or females)--benign and malignant subcutaneous tumors (fibroma and fibrosarcoma), benign pancreatic tumors (acinar and islet cell adenoma), benign liver tumors (neoplastic nodules), and benign mammary gland tumors (fibroadenoma). Mice (females only)--benign and malignant blood vessel tumors (hemangioma andhemangiosarcoma), benign liver tumors (hepatocellular adenoma). The NOEL for carcinogenicity in mice was 60 mg/kg. For rats, no NOEL was established for malignant or benign tumors. Although TDI induced tumors via gavage, no tumors were produced via inhalation, which is the relevant route of exposure for humans.

**Mutagenicity:**
A number of in-vitro, in-vivo, and in-vivo/in-vitro mutagenicity assays have been conducted, with both positive and negative results being reported. Mutagenic assay results: 1. Salmonella typhimurium assay (Ames assay)--positive results with metabolic activation. 2. Sister chromatid exchange assay using cultured human lymphocytes--positive. 3. Sister chromatid exchange assay using Chinese hamster ovary cells--negative. 4. Micronucleus assay (mice and rats exposed via inhalation)--no biologically significant effect. 5. Unscheduled DNA synthesis (UDS) assay (rats exposed via inhalation: hepatocytes and lungs evaluated)--negative.

**Developmental Toxicity/Teratogenicity:**
TDI has been evaluated for developmental toxicity using rats. Pregnant dams were exposed via inhalation to TDI concentrations of 0, 0.02, 0.1, and 0.5 ppm (0.1, 0.73, and 3.6 mg/m3). There were no teratogenic effects. At a dose of 0.5 ppm, which was maternally toxic (based on a reduction in body weight gain), there was an increase in the incidence of incompletely ossified centrum for the 5th cervical vertebra. This incomplete ossification indicates minimal
fetotoxicity at a dose of 0.05 ppm. For teratogenic effects the NOEL = 0.5 ppm, for fetal effects the NOEL = 0.1 ppm, and the maternal NOEL = 0.1 ppm.

**Toxicity to Reproduction/Fertility:**

TDI has been evaluated for reproductive toxicity in a two-generation reproduction study using rats. Adults and offspring were exposed via inhalation to TDI at concentrations of 0, 0.02, 0.08, and 0.3 ppm (0.1, 0.6, and 2 mg/m3). There were no reproductive effects. The only neonatal effect was a reduction in body weight during the lactation phase for the F2 pups in the 0.08 and 0.3 ppm dose groups (Note: there was no effect on the F1 pup body weights). The NOEL = 0.3 ppm for reproductive effects and 0.1 ppm for pup effects.

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**Section 12: Ecological Information**

**Ecological Data for ADDOLINK TT 44C/528S**

**Ecological Note:** No data available for this product.

**Ecological Data for Toluene Diisocyanate Dimer**

**Ecological Note:** No data available for this component.

**Ecological Data for 2,4-Toluene Diisocyanate Monomer (TDI)**

**Fish Toxicity:** 165 mg/L, 96 hrs. Fathead minnow (Pimephales promelas)

**Invertebrate Toxicity:**

> 508 mg/L, 96 hrs. Grass shrimp

> 500 mg/L, 24 hrs. Water flea (Daphnia magna)

**Ecological Note:** Data is for Toluene Diisocyanate mixed isomers

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**Section 13: Disposal Considerations**

**Waste Disposal Method:** Disposal must be in compliance with federal, state and local environmental control regulations. TDI must be disposed of in a permitted incinerator or landfill. Incineration is the preferred method of disposal. Solids are usually incinerated or landfilled.

**Empty Container Precautions:** Empty container retains product residue and can be hazardous. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat, flame, sparks, static electricity, or other sources of ignition. Vapors and gases may be highly toxic.

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**Section 14: Transportation Information**

**Technical shipping name:** Aromatic Polyisocyanate
### RSPA/DOT Regulated Components:

<table>
<thead>
<tr>
<th>Component(s)/ CAS Number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-Toluene Diisocyanate Monomer (TDI) 584-84-9</td>
<td>100 lb</td>
</tr>
</tbody>
</table>

- **RQ.**  
  - Min.: 0%  
  - Max.: 1%

### Freight Class

- **Bulk:** Chemicals, N.O.I. (NMFC 60000)
- **Package:** Chemicals, N.O.I. (NMFC 60000)

### Product Label:

- Product Label Established

### Domestic Surface Transportation (DOT)

- **Hazard Class or Division:** Non-Regulated

### Marine Transportation (IMO / IMDG)

- **Hazard Class Division:** Non-Regulated

### Air Transportation (ICAO / IATA)

- **Hazard Class Division:** Non-Regulated

### Section 15: Regulatory Information

#### United States Federal Regulations

- **OSHA Hazcom Standard Rating:** Hazardous
- **TSCA Inventory List:** On TSCA Inventory

#### CERCLA Hazardous Substance:

<table>
<thead>
<tr>
<th>Component(s)</th>
<th>Reportable Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-Toluene Diisocyanate Monomer (TDI) 584-84-9</td>
<td>100 lb</td>
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</tbody>
</table>

#### SARA Title III

- **SARA Section 302 Extremely Hazardous Substances:**
  
<table>
<thead>
<tr>
<th>Component(s)/ CAS Number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-Toluene Diisocyanate Monomer (TDI) 584-84-9</td>
<td>0% - 1%</td>
</tr>
</tbody>
</table>

- **SARA Section 311/312 Hazard Categories:**
  - Immediate Health Hazard
  - Delayed Health Hazard
  - Sudden Pressure Release Hazard
  - Reactive Hazard

- **SARA Section 313 Toxic Chemicals:**

<table>
<thead>
<tr>
<th>Component(s)/ CAS Number</th>
<th>Reporting Threshold</th>
<th>Concentration</th>
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</thead>
<tbody>
<tr>
<td>2,4-Toluene Diisocyanate Monomer (TDI) 584-84-9</td>
<td>0.1 %</td>
<td>0% - 1%</td>
</tr>
</tbody>
</table>
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

**State Right-to-Know Information**

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<th>CAS Number</th>
<th>Component(s)</th>
<th>State Code</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene Diisocyanate Dimer 26747-90-0</td>
<td>PA-N, NJ-N</td>
<td>95% 0%</td>
<td></td>
</tr>
</tbody>
</table>

The following component(s) are listed under Pennsylvania Special Hazards:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Component(s)</th>
<th>State Code</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>584-84-9</td>
<td>2,4-Toluene Diisocyanate Monomer (TDI)</td>
<td>PA-S</td>
<td>0% 1%</td>
</tr>
</tbody>
</table>

The following component(s) are listed under Massachusetts Extra-ordinary Hazards:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Component(s)</th>
<th>State Code</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>584-84-9</td>
<td>2,4-Toluene Diisocyanate Monomer (TDI)</td>
<td>MA-X</td>
<td>0% 1%</td>
</tr>
</tbody>
</table>

The following component(s) are listed under California Proposition 65:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Component(s)</th>
<th>State Code</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>584-84-9</td>
<td>2,4-Toluene Diisocyanate Monomer (TDI)</td>
<td>CA-C</td>
<td>0% 1%</td>
</tr>
</tbody>
</table>

State Code Translation Table

- PA-N = Pennsylvania Non-hazardous
- PA-S = Pennsylvania Special Substances List
- NJ-N = New Jersey Other - includes predominant ingredients
- MA-X = Massachusetts Extra-ordinary Hazardous Substance List
- CA-C = Warning! This chemical is known to the State of California to cause cancer.

**Section 16: Other Information**

**NFPA 704M Rating**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

**HMIS Rating**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

*=Chronic Health Hazard

RHEIN CHEMIE CORPORATION’s method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by RHEIN CHEMIE CORPORATION as a customer service.

Contact: HES Dept.
Phone: (440) 285-3547
MSDS Number: 000000000047
Version Date: 01/08/2007
MSDS Version: 2.11

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Indicates Relevant Change Made.