Material Safety Data Sheet

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Chemical Product
Dicyclohexylmethane diisocyanate, Methylene bis(4-cyclohexyl-isocyanate), Bis(para-isocyanato cyclo-hexyl methane (PICM), Saturated MDI, Hydrogenated MDI (HMDI or H12MDI), Reduced MDI (rMDI)

Product Name: WANNATE HMDI

Company Identification
Yantai Wanhua Polyurethanes Co., LTD
NO.7 South Xingfu Road, Yantai, Shandong China
Zip code: 264002 Fax: 0535-6801497
For emergencies Tel. 0535—6837888—8622

Manufacturer
Ningbo Wanhua Polyurethanes Co., LTD
NO.39 Huandao North Road, Daxie Development Zone, Ningbo, Zhejiang, PRC

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 4—Methylene bis(4-cyclohexyl-isocyanate)</td>
<td>5124-30-1</td>
<td>99% min</td>
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</tbody>
</table>

Section 3 - HAZARDS IDENTIFICATION

HAZARD TO HUMANS AND THE ENVIRONMENT Hazard by inhalation, eye contact and ingestion. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact.

Section 4 - FIRST AID MEASURES

INHALATION: If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

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

INGESTION: If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.
SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - HANDLING AND STORAGE

HANDLING
Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed containers. Precautions must be taken to avoid contamination by moisture and air. Processability of this material can be adversely affected by contamination. Water or moisture in the air reacts with the product to generate pressure. If stored for prolonged periods at or below a temperature of 77°F, crystallization and settling of the isomer may occur. Storage in a cold warehouse can cause crystals to form. These crystals can settle to the bottom of the container. If the crystals do form, they can be melted easily with moderate heat. It is suggested that a container the size of a drum be warmed for 16–24 hours at 104–122°F (40–50°C.)

SPECIAL REQUIREMENTS
Moisture sensitive.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS - DENMARK

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEL</td>
<td>TWA</td>
<td>0.054 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.005 ppm</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS - GERMANY

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>TRGS 900</td>
<td>OEL</td>
<td>0.054 mg/m³</td>
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</tbody>
</table>

Remarks: H, 29, NL
EXPOSURE LIMITS - NORWAY

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEL</td>
<td></td>
<td>0.05 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.005 ppm</td>
</tr>
</tbody>
</table>

Remarks: A 3)

EXPOSURE LIMITS - UNITED KINGDOM

<table>
<thead>
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<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEL</td>
<td></td>
<td>0.02 mg (NCO)/m³</td>
</tr>
<tr>
<td>OEL</td>
<td></td>
<td>0.07 mg (NCO)/m³</td>
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</table>

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance Physical State: white or pale yellow Liquid

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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</thead>
<tbody>
<tr>
<td>pH</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BP/MP Range</td>
<td>190°C @ 5mmHg</td>
<td></td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>19.0 - 23.0 °C</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>211 °C</td>
<td>Method: closed cup</td>
</tr>
<tr>
<td>Flammability</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Auto Ignition Temp</td>
<td>&gt; 220°C</td>
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<tr>
<td>Oxidizing Properties</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Explosion Limits</td>
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<tr>
<td>Vapor Pressure</td>
<td>N/A</td>
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</tr>
<tr>
<td>SG/Density</td>
<td>1.066 g/cm³</td>
<td></td>
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<tr>
<td>Partition Coefficient</td>
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<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
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<tr>
<td>Vapor Density</td>
<td>9</td>
<td></td>
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<tr>
<td>Saturated Vapor Conc.</td>
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<td></td>
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<tr>
<td>Evaporation Rate</td>
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<tr>
<td>Bulk Density</td>
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<tr>
<td>Decomposition Temp.</td>
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</tr>
<tr>
<td>Solvent Content</td>
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<td></td>
</tr>
<tr>
<td>Water Content</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Surface Tension</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
Conductivity  N/A
Miscellaneous Data N/A
Solubility  soluble in Beneze, Toluene and Chlorobenzene but reacting with water

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

STABILITY: Stable.
Conditions to Avoid: Heat.
Materials to Avoid: Amines, Strong bases, Alcohols, Heavy metals.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY
LD50
Skin
Rabbit
> 10,000 mg/kg
LC50
Inhalation
Rat
434 mg/m3
4 H
LC50
Inhalation
Rat
295.0 - 307.0 ppm

LD50
Oral
Rat
9900 mg/kg
Gastrointestinal: Hypermotility, diarrhea. Liver: Other changes.

LC50
Inhalation
Guinea pig
51 mg/m³

1H
Remarks: Lungs, Thorax, or Respiration: Other changes.

IRRITATION DATA
Eyes
Rabbit
Remarks: Mild irritation effect

Skin
Rabbit

0.5 ml
24H
Remarks: Moderate irritation effect

Eyes
Rabbit
0.1 ml
Remarks: Mild irritation effect

Eyes
Rabbit
0.1 ml
24H
Remarks: Severe irritation effect

SENSITIZATION
Sensitization: May cause allergic respiratory and skin reactions

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Lachrymator. Causes eye irritation.
Inhalation: Toxic if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION
Lungs.

Section 12 – ECOLOGICAL INFORMATION
ECOTOXICOLOGICAL EFFECTS
Test Type: LC50 Fish
Species: Brachydanio rerio
Time: 96 h
Value: 1.2 mg/l

Section 13 - DISPOSAL CONSIDERATIONS
SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - TRANSPORTATION INFORMATION
RID/ADR
UN#: 2206
Class: 6.1
PG: II
Proper Shipping Name: Isocyanates, toxic, n.o.s.

IMDG
UN#: 2206
Class: 6.1
PG: II
Proper Shipping Name: Isocyanates, toxic, n.o.s.
Marine Pollutant: No
Severe Marine Pollutant: No
Technical Name: Required

IATA
UN#: 2206
Class: 6.1
PG: II
Proper Shipping Name: Isocyanates, toxic, n.o.s.
Inhalation Packing Group I: No
Technical Name: Required

Section 15 - REGULATORY INFORMATION
CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 615-009-00-0
INDICATION OF DANGER: Toxic.

R-PHRASES: 23-36/37/38-42/43
Toxic by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact.

S-PHRASES: 26-28-38-45
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap-suds. In case of insufficient ventilation, wear suitable respiratory equipment. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Section 16 - OTHER INFORMATION

Disclaimer:
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. Yantai shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Completed on: 01/20/2009

Revised on:

Completed by: National Registration Center for Chemical, SAWS

Audit by: Yantai Wanhua Polyurethanes Co., Ltd