Material Safety Data Sheet

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:
4,4'-diphenyl methane diisocyanate

Synonyms:
MDI; diphenyl methane-4,4-diisocyanate; methylene diphenyl diisocyanate

Production name:
MDI-50

Company identification:
wanhua polyurethane company, Limited.
7 south xingfu road, Yantai, Shandong China
Zip code: 264013    Fax: 0535–6875138
For emergencies Tel. +86-535–3388958
+86-532-83889090

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>%</th>
<th>CAS RN</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 4' - diphenyl methane diisocyanate</td>
<td>46–50%</td>
<td>101–68–8</td>
</tr>
<tr>
<td>2, 4- diphenyl methane diisocyanate</td>
<td>50–54%</td>
<td>5873–54–1</td>
</tr>
</tbody>
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Section 3 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE:
HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS.

RISK: S6

- Harmful by inhalation.
- Irritating to eyes, respiratory system and skin.
- May cause SENSITISATION by inhalation and skin contact.
- Skin contact may produce health damage*.
- Limited evidence of a carcinogenic effect*.
- May possibly affect fertility*.
- * (limited evidence).

Section 4 - FIRST AID MEASURES

EYE

If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
If solids or aerosol mists are deposited upon the skin:
· Flush skin and hair with running water (and soap if available).
· Remove any adhering solids with industrial skin cleansing cream.
· DO NOT use solvents.
· Seek medical attention in the event of irritation.

INHALED
· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor, without delay.

SWALLOWED
Do NOT induce vomiting. Give warm water. If effects occur, get medical aid.

Section 5 - FIRE FIGHTING MEASURES
Suitable extinguishing media:
Dry chemical powder. Carbon dioxide. Alcohol stable foam.

Extinguishing media which must not be used for safety reasons:
high pressure water jet.

Special exposure hazards arising from the product itself, from combustion products or from resulting gases:
When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour. Burns with acrid black smoke and poisonous fumes.

Special protective equipment for firefighters:
· Breathing apparatus.
· Gas tight chemical resistant suit.
· Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES
General: Evacuate and ventilate spill area, dike spill to prevent entry into water system, wear full protective equipment including respiratory equipment during clean up.

Major spill: If temporary control of isocyanate vapor is required a blanket of protein foam or other suitable foam (available at most fire departments), may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

Minor spill: Absorb the isocyanate with an acceptable absorbent. Shovel into open
containers. Do not make pressure tight. Move to a well ventilated area (outside) and neutralize with a mixture of 90% water, 3-8% ammonia and 2-7% detergent. Add at 10 to 1 ratio. Let stand for 48 hours letting evolved CO2 escape. Proceed with final clean up of spill area.

**Clean up:** Decontaminate spill area using neutralizing solution and let stand for at least 10 minutes.

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**Section 7 - HANDLING AND STORAGE**

**Handling:**
Handle and open container with care. Use good occupational work practice. Avoid breathing vapours and contact with skin and eyes. Avoid contact with moisture. Avoid physical damage to containers. Wear protective clothing and gloves when handling containers. Use in a well-ventilated area. Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required, until atmosphere has been checked. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Avoid cross contamination between the two liquid parts of product (kit). If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur. This excess heat may generate toxic vapour.

**Storage:**
Store in a cool, dry, well-ventilated area. Keep away from open flame, heat source. Separate from incompatible, such as acids, bases, amine and alcohols.
Storage temperature is 25°C ~ 35°C.

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**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Exposure Controls:** TLV-TWA(mg/m3): 0.055mg/m3 (ACGIH, USA)
IDLH: 10ppm (ACGIH, USA)

**Personal protection:**
- **Respiratory Protection:**
  When concentrations in air exceed a exposure limit, wear a self-contained breathing apparatus.
- **Skin/Body protection:**
  Wear clothing sufficient to prevent all skin contact should be worn, such as coveralls and long sleeves. Use impervious gloves.
- **Hand protection:**
  Wear chemical resistant gloves.
- **Eye Protection:**
  ANSI APPROVED SAFETY GLASSES (FP N).
- **Other Protective:**
  No smoking at workplace. EYEWASH AND DELUGE SHOWER MEETING ANSI DESIGN. Wash thoroughly after handling. DO NOT return unused product to containers.
Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state: white to light yellow color solid or light yellow color Liquid.

pH: Not available.

Freezing/melting point: ≥38

Relative Density (water=1): 1.19

Relative Vapor Density (air=1): Not available.

Saturated vapor pressure (mmHg): Not available.

Combustion heat (kJ/mol): Not available.

Critical temperature (°C): Not available.

Critical pressure (MPa): Not available.

Flash point(°C): 170°C ~ 230°C

Explosion Limits, lower: Not available.

Explosion Limits, upper: Not available.

Solubility in water: Reaction

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

Incompatibilities with water, acids, alkalies, alcohol, amines. Conditions to avoid Light. Contact with moisture, other materials which react with isocyanates, or temperatures over 200°C may cause polymerization.

Section 11 - TOXICOLOGICAL INFORMATION

Toxicity:

LD₅₀ : 10000mg/kg (rabbit, skin)

LC₅₀ : 369 ~ 490mg/m³ (4h, rat, inhalation)

Irritation:

Eye : 100mg, moderate (rabbit)

Carcinogenicity:  NTP  IARC Monographs  OSHA limit

None  None  None

Section 12 - ECOLOGICAL INFORMATION

Environmental Toxicity Test Data:

LC₅₀ : >500mg/l/24h(zebrafish, static)

EC₅₀ : >500mg/l/24h (daphnia)

Section 13 - DISPOSAL CONSIDERATIONS

Recycle wherever possible or consult manufacturer for recycling options.

Consult State Land Waste Management Authority for disposal.

Recycle containers if possible, or dispose of in an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:TDG, ADR, IATA, IMDG

Section 15 - REGULATORY INFORMATION

Risk: S6
Listed on China Regulations:
Regulations on Dangerous Chemical Articles: yes.
Implementation Rules of Regulations on Dangerous Chemical Articles: None.
Rules on Safe Use of Chemical Articles in Workplace: None.

Section 16 - OTHER INFORMATION

Disclaimer:
This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

Completed on: 5/24/2006
Completed by: YCS
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Audit by: GDF