



## Erapol EMD288RB

Erapol Co. GHS Safety Data Sheet (REVIEW)  
Jan-31-2012  
B614L

Hazard Alert Code: MODERATE

ERAPOL CO. 9-31569  
Version No:2.0  
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### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT NAME

Erapol EMD288RB

#### PRODUCT USE

Polyurethane Prepolymer

#### SUPPLIER

Company: Era Polymers Pty Ltd

Address:

25- 27 Green Street, Banksmeadow, NSW 2019,  
Australia

Telephone: +61 2 9666 3788

Emergency Tel: **1800 039 008 (AUS)**

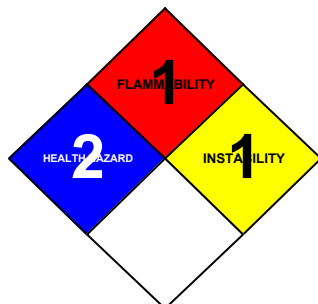
Emergency Tel: **+80024362255 (INTL)**

Fax: +61 2 9666 4805

Email: [erapol@erapol.com.au](mailto:erapol@erapol.com.au)

### Section 2 - HAZARDS IDENTIFICATION

#### NFPA



#### GHS Classification

Eye Irritation Category 2A

Respiratory Sensitizer Category 1

Skin Corrosion/Irritation Category 2

Skin Sensitizer Category 1

STOT - RE Category 2

STOT - SE Category 3

continued...

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Section 2 - HAZARDS IDENTIFICATION



## EMERGENCY OVERVIEW

### HAZARD

DANGER

Determined by Chemwatch using GHS criteria

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| H315 | Causes skin irritation.                                                    |
| H317 | May cause an allergic skin reaction.                                       |
| H319 | Causes serious eye irritation.                                             |
| H334 | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| H335 | May cause respiratory irritation.                                          |
| H373 | May cause damage to organs through prolonged or repeated exposure.         |

## PRECAUTIONARY STATEMENTS

### Prevention

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray.                           |
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray.                          |
| P264 | Wash ... thoroughly after handling.                                        |
| 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. |
| P285 | In case of inadequate ventilation wear respiratory protection.             |

### Response

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| P302+P352      | IF ON SKIN: Wash with plenty of soap and water.                                                                                  |
| P304+P340      | IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.                                        |
| P304+P341      | IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing.             |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P312           | Call a POISON CENTER or doctor/physician if you feel unwell.                                                                     |
| P314           | Get medical advice/attention if you feel unwell.                                                                                 |
| P333+P313      | If skin irritation or rash occurs: Get medical advice/attention.                                                                 |
| P337+P313      | If eye irritation persists: Get medical advice/attention.                                                                        |
| P342+P311      | If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.                                                  |
| P363           | Wash contaminated clothing before reuse.                                                                                         |

### Storage

|           |                                                                   |
|-----------|-------------------------------------------------------------------|
| P403+P233 | Store in a well- ventilated place. Keep container tightly closed. |
| P405      | Store locked up.                                                  |

### Disposal

|      |                                      |
|------|--------------------------------------|
| P501 | Dispose of contents/container to ... |
|------|--------------------------------------|

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## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                                             | CAS RN         | %     |
|--------------------------------------------------|----------------|-------|
| 4, 4' - diphenylmethane diisocyanate (MDI)       | 101-68-8       | 10-20 |
| Other ingredients determined not to be hazardous | 00000000-00-0* | >60   |

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh 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.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in 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.

### NOTES TO PHYSICIAN

- Treat symptomatically.

For sub-chronic and chronic exposures to isocyanates:

- This material may be a potent pulmonary sensitizer which causes bronchospasm even in patients without prior airway hyperreactivity.
- Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
- Conjunctival irritation, skin inflammation (erythema, pain vesication) and gastrointestinal disturbances occur soon after exposure.
- Pulmonary symptoms include cough, burning, substernal pain and dyspnea.
- Some cross-sensitivity occurs between different isocyanates.
- Noncardiogenic pulmonary edema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
- Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
- There is no effective therapy for sensitized workers. [Ellenhorn and Barceloux: Medical Toxicology]NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the

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Section 4 - FIRST AID MEASURES

concentration and duration of exposure. They induce smooth muscle contraction which lead to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity. [Karol Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992].

## Section 5 - FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

### FIRE/EXPLOSION HAZARD

- Combustible.
- Moderate fire hazard when exposed to heat or flame.
- When heated to high temperatures decomposes rapidly generating vapor which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapor.
- Burns with acrid black smoke and poisonous fumes.
- Combustion yields traces of highly toxic hydrogen cyanide HCN, plus toxic nitrogen oxides NOx and carbon monoxide.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

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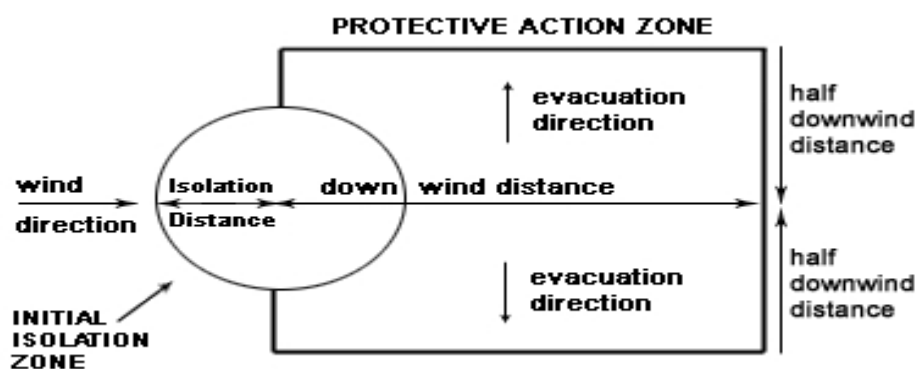
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## Section 6 - ACCIDENTAL RELEASE MEASURES

### MAJOR SPILLS

- Moderate hazard.
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources. Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

### PROTECTIVE ACTIONS FOR SPILL



From US Emergency Response Guide 2000  
Guide

### SMALL SPILLS

| Name | Isolation Distance<br>ft ( m ) | Downwind Day<br>mile ( km ) | Protection Night<br>mile ( km ) |
|------|--------------------------------|-----------------------------|---------------------------------|
|------|--------------------------------|-----------------------------|---------------------------------|

### LARGE SPILLS

| Name | Isolation Distance<br>ft ( m ) | Downwind Day<br>mile ( km ) | Protection Night<br>mile ( km ) |
|------|--------------------------------|-----------------------------|---------------------------------|
|------|--------------------------------|-----------------------------|---------------------------------|

From IERG (Canada/Australia)

|                              |      |
|------------------------------|------|
| Isolation Distance           | -    |
| Downwind Protection Distance | -    |
| IERG Number                  | None |

### FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapor plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapor concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take

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## Section 6 - ACCIDENTAL RELEASE MEASURES

protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localized wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".

LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

|                                         |                     |
|-----------------------------------------|---------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | 25mg/m <sup>3</sup> |
|-----------------------------------------|---------------------|

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

|                                         |                    |
|-----------------------------------------|--------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | 2mg/m <sup>3</sup> |
|-----------------------------------------|--------------------|

other than mild, transient adverse effects without perceiving a clearly defined odour is:

|                                         |                      |
|-----------------------------------------|----------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | 0.2mg/m <sup>3</sup> |
|-----------------------------------------|----------------------|

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

|                 |          |               |         |
|-----------------|----------|---------------|---------|
| Very Toxic (T+) | >= 0.1%  | Toxic (T)     | >= 3.0% |
| R50             | >= 0.25% | Corrosive (C) | >= 5.0% |
| R51             | >= 2.5%  |               |         |
| else            | >= 10%   |               |         |

where percentage is percentage of ingredient found in the mixture

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.

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Section 7 - HANDLING AND STORAGE

- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

## SUITABLE CONTAINER

- Metal can or drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

## STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

## SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+



X



+



X



X



+

+: May be stored together

O: May be stored together with specific preventions

X: Must not be stored together

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

| Source                                                 | Material                                                                                                             | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes   |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|---------|
| Canada - Alberta Occupational Exposure Limits          | 4, 4' - diphenylmethane diisocyanate (MDI) (Diphenylmethane-4, 4'diisocyanate (Methylene bisphenyl isocyanate, MDI)) | 0.005   | 0.05                  |          |                        |          |                        |          |         |
| Canada - British Columbia Occupational Exposure Limits | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                    | 0.005   |                       |          |                        | 0.01     |                        |          | Skin; S |

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

| Source                                                                          | Material                                                                                                                         | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes                                |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|--------------------------------------|
| Canada - Ontario Occupational Exposure Limits                                   | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI) / Diisocyanate- 4, 4' de diphenylméthane (MDI)) | 0.005   |                       |          |                        | 0.02     |                        |          |                                      |
| US NIOSH Recommended Exposure Limits (RELs)                                     | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate)                                                      | 0.005   | 0.05                  |          |                        | 0.020    | 0.2                    |          | (Ceiling ([10-minute]))              |
| Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English) | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bis (4- phenyl isocyanate) (MDI))                                          | 0.005   | 0.051                 |          |                        |          |                        |          |                                      |
| US OSHA Permissible Exposure Levels (PELs) - Table Z1                           | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                                |         |                       |          |                        | 0.02     | 0.2                    |          |                                      |
| US ACGIH Threshold Limit Values (TLV)                                           | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate [MDI])                                                | 0.005   |                       |          |                        |          |                        |          | TLV Basis: respiratory sensitization |
| US - Minnesota Permissible Exposure Limits (PELs)                               | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                                |         |                       |          |                        | 0.02     | 0.2                    |          |                                      |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants       | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                                |         |                       |          |                        | 0.02     | 0.2                    |          |                                      |

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

| Source                                                                                          | Material                                                                                                        | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|-------|
| US - Vermont Permissible Exposure Limits Table Z- 1- A Transitional Limits for Air Contaminants | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                               | (C)0.02 | (C)0.2                |          |                        |          |                        |          |       |
| US - Vermont Permissible Exposure Limits Table Z- 1- A Final Rule Limits for Air Contaminants   | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                               |         |                       |          |                        | 0.02     | 0.2                    |          |       |
| US - Idaho - Limits for Air Contaminants                                                        | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                               |         |                       |          |                        | 0.02     | 0.2                    |          |       |
| US - California Permissible Exposure Limits for Chemical Contaminants                           | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bis(phenylisocyanate); MDI; diphenylmethane diisocyanate) | 0.005   | 0.051                 |          |                        |          |                        |          |       |
| US - Hawaii Air Contaminant Limits                                                              | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                               |         |                       |          |                        | 0.02     | 0.2                    |          |       |
| US - Alaska Limits for Air Contaminants                                                         | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                               |         |                       |          |                        | 0.02     | 0.2                    |          |       |
| US - Michigan Exposure Limits for Air Contaminants                                              | 4, 4' - diphenylmethane diisocyanate (MDI) (Methyl bisphenyl isocyanate (MDI))                                  |         |                       |          |                        | 0.02     | 0.2                    |          |       |

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

| Source                                                                                  | Material                                                                                                            | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes                                |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|--------------------------------------|
| Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                   | 0.005   |                       | 0.015    |                        |          |                        |          |                                      |
| Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances           | 4, 4' - diphenylmethane diisocyanate (MDI) (Diphenylmethane diisocyanate, see Methylene bisphenyl isocyanate (MDI)) | 0.02    | 0.2                   | -        | -                      |          |                        |          |                                      |
| US - Washington Permissible exposure limits of air contaminants                         | 4, 4' - diphenylmethane diisocyanate (MDI) (MDI (Methylene bisphenyl isocyanate) (Diphenylmethane diisocyanate))    |         |                       |          |                        | 0.02     |                        |          |                                      |
| Canada - Nova Scotia Occupational Exposure Limits                                       | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate [MDI])                                   | 0.005   |                       |          |                        |          |                        |          | TLV Basis: respiratory sensitization |
| Canada - Prince Edward Island Occupational Exposure Limits                              | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate [MDI])                                   | 0.005   |                       |          |                        |          |                        |          | TLV Basis: respiratory sensitization |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants        | 4, 4' - diphenylmethane diisocyanate (MDI) (Methylene bisphenyl isocyanate (MDI))                                   |         |                       |          |                        | 0.02     | 0.2                    |          |                                      |

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

| Source                                                                | Material                                                                                                            | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|-------|
| US - Oregon Permissible Exposure Limits (Z- 2)                        | 4, 4' - diphenylmethane diisocyanate (MDI)<br>(Diphenylmethane diisocyanate (MDI))                                  | 0.005   | 0.050                 |          |                        | 0.200    | 0.02                   |          |       |
| Canada - Northwest Territories Occupational Exposure Limits (English) | 4, 4' - diphenylmethane diisocyanate (MDI)<br>(Diphenylmethane diisocyanate (Methylene bisphenyl-isocyanate) (MDI)) |         |                       |          |                        | 0.02     | 0.2                    |          |       |

The following materials had no OELs on our records

• Other ingredients determined not to be hazardous:

CAS:00000000- 00- 0

### EMERGENCY EXPOSURE LIMITS

Material

4,4'-diphenylmethane diisocyanate (MDI)|2489

Revised IDLH Value (mg/m<sup>3</sup>)

75

Revised IDLH Value (ppm)

### MATERIAL DATA

OTHER INGREDIENTS DETERMINED NOT TO BE HAZARDOUS:

Not available

### PERSONAL PROTECTION



### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### HANDS/FEET

■ NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

### RESPIRATOR

•Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

■ Spraying of material or material in admixture with other components must be carried out in conditions conforming to local state regulations. Local exhaust ventilation with full face air supplied breathing apparatus (hood or helmet type) is normally required. Unprotected personnel must vacate spraying area.

NOTE: Isocyanate vapors will not be adequately absorbed by organic vapor respirators.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Light/Clear/Yellow/Brown Colour

### PHYSICAL PROPERTIES

Liquid.

|                           |               |                                |                                                      |
|---------------------------|---------------|--------------------------------|------------------------------------------------------|
| State                     | Liquid        | Molecular Weight               | Not Available                                        |
| Melting Range (°F)        | Not Available | Viscosity                      | Not Available                                        |
| Boiling Range (°F)        | >482          | Solubility in water (g/L)      | Reacts with water liberating carbon dioxide [Reacts] |
| Flash Point (°F)          | >302          | pH (1% solution)               | Not Available                                        |
| Decomposition Temp (°F)   | Not Available | pH (as supplied)               | Not Available                                        |
| Autoignition Temp (°F)    | Not Available | Vapour Pressure (mmHG)         | Not Available                                        |
| Upper Explosive Limit (%) | Not Available | Specific Gravity (water=1)     | 1.12                                                 |
| Lower Explosive Limit (%) | Not Available | Relative Vapor Density (air=1) | Not Available                                        |
| Volatile Component (%vol) | Not Available | Evaporation Rate               | Not Available                                        |

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

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## Section 11 - TOXICOLOGICAL INFORMATION

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

■ The material is not thought to produce adverse health effects following ingestion (as classified using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

- This material can cause inflammation of the skin on contact in some persons.
- The material may accentuate any pre-existing dermatitis condition.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

- Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

#### CHRONIC HEALTH EFFECTS

■ Harmful: danger of serious damage to health by prolonged exposure through inhalation. This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. This has been demonstrated via both short- and long-term experimentation. There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Isocyanate vapors are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. Digestive effects include nausea and vomiting. Breathing difficulties may occur unpredictably after a period of tolerance and after skin contact. Allergic inflammation of the skin can occur, with rash, itching, blistering, and swelling of the hands and feet. Sensitive people can react to very low levels and should not be exposed to this material.

#### TOXICITY AND IRRITATION

4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI):

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- Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.
- Attention should be paid to atopic diathesis, characterized by increased susceptibility to nasal inflammation, asthma and eczema.
- Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine

continued...

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the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitization potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitizing substance which is widely distributed can be a more important allergen than one with stronger sensitizing potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

ERAPOL EMD288RB:

~OTHER

4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI):

### TOXICITY

Oral (rat) LDLo: 9200 mg/kg

Oral (mouse) LD50: 2200 mg/kg Dermal Sensitiser \*

Dermal (rabbit) LD50: >6200 mg/kg \* Respiratory Sensitiser

(g.pig) \*

Oral (Rat) LD50: 9200 mg/kg [\* = Bayer CCINFO 2133615]

■ The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Isocyanate vapors are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. Digestive effects include nausea and vomiting. Breathing difficulties may occur unpredictably after a period of tolerance and after skin contact. Allergic inflammation of the skin can occur, with rash, itching, blistering, and swelling of the hands and feet. Sensitive people can react to very low levels and should not be exposed to this material.

Inhalation (human) TClO: 0.13 ppm/30 mins Eye (rabbit): 0.10 mg moderate

### IRRITATION

Skin (rabbit): 500 mg /24 hours

OTHER INGREDIENTS DETERMINED NOT TO BE HAZARDOUS:

■ None assigned. Refer to individual constituents.

### CARCINOGEN

|                                                                                   |                                                                                                         |                 |     |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------|-----|
| 4, 4' -<br>Methylenediphenyl<br>diisocyanate                                      | International Agency<br>for Research on Cancer<br>(IARC) - Agents<br>Reviewed by the IARC<br>Monographs | Group           | 3   |
| Methylene Diphenyl<br>Diisocyanate (monomeric<br>MDI) and polymeric MDI<br>(PMDI) | US EPA Carcinogens<br>Listing                                                                           | Carcinogenicity | D   |
| Methylene Diphenyl<br>Diisocyanate (monomeric<br>MDI) and polymeric MDI<br>(PMDI) | US EPA Carcinogens<br>Listing                                                                           | Carcinogenicity | CBD |

continued...

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|                                                                          |                                                     |                     |     |
|--------------------------------------------------------------------------|-----------------------------------------------------|---------------------|-----|
| Methylene Diphenyl Diisocyanate (monomeric MDI) and polymeric MDI (PMDI) | US ACGIH Threshold Limit Values (TLV) - Carcinogens | Carcinogen Category | D   |
| Methylene Diphenyl Diisocyanate (monomeric MDI) and polymeric MDI (PMDI) | US ACGIH Threshold Limit Values (TLV) - Carcinogens | Carcinogen Category | CBD |
| 4, 4' - diphenylmethane diisocyanate (MDI)                               | US - Rhode Island Hazardous Substance List          | IARC                |     |
| 4, 4' - diphenylmethane diisocyanate (MDI)                               | US - Maine Chemicals of High Concern List           | Carcinogen          | D   |
| 4, 4' - diphenylmethane diisocyanate (MDI)                               | US - Maine Chemicals of High Concern List           | Carcinogen          | CBD |

### SKIN

|                                            |                                                               |          |         |
|--------------------------------------------|---------------------------------------------------------------|----------|---------|
| 4, 4' - diphenylmethane diisocyanate (MDI) | Canada - British Columbia Occupational Exposure Limits - Skin | Notation | Skin; S |
|--------------------------------------------|---------------------------------------------------------------|----------|---------|

## Section 12 - ECOLOGICAL INFORMATION

4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI):

■ DO NOT discharge into sewer or waterways.

Fish LC50 (96 h): 95.24-134.37 mg/L

OTHER INGREDIENTS DETERMINED NOT TO BE HAZARDOUS:

### Ecotoxicity

| Ingredient                                       | Persistence: Water/Soil | Persistence: Air  | Bioaccumulation | Mobility |
|--------------------------------------------------|-------------------------|-------------------|-----------------|----------|
| 4, 4' - diphenylmethane diisocyanate (MDI)       | LOW                     | LOW               | LOW             | LOW      |
| Other ingredients determined not to be hazardous | No Data Available       | No Data Available |                 |          |

## Section 13 - DISPOSAL CONSIDERATIONS

■ Puncture containers to prevent re-use and bury at an authorized landfill.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- DO NOT recycle spilled material.
- Consult Waste Management Authority for disposal.
- Neutralize spill material carefully and decontaminate empty containers and spill residues with 10% ammonia solution plus detergent or a proprietary decontaminant prior to disposal.
- DO NOT seal or stopper drums being decontaminated as CO<sub>2</sub> gas is generated and may pressurize containers
- Puncture containers to prevent re-use.

continued...

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## Section 13 - DISPOSAL CONSIDERATIONS

- Bury or incinerate residues at an approved site.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

### REGULATIONS

#### Regulations for ingredients

**4,4'-diphenylmethane diisocyanate (MDI) (CAS: 101-68-8,26447-40-5) is found on the following regulatory lists;**

"Canada - Alberta Ambient Air Quality Objectives", "Canada - Alberta Occupational Exposure Limits", "Canada - British Columbia Occupational Exposure Limits", "Canada - Northwest Territories Occupational Exposure Limits (English)", "Canada - Nova Scotia Occupational Exposure Limits", "Canada - Ontario Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)", "Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada National Pollutant Release Inventory (NPRI)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Oregon Permissible Exposure Limits (Z-2)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US CAA (Clean Air Act) - HON Rule - Organic HAPs (Hazardous Air Pollutants)", "US Clean Air Act - Hazardous Air Pollutants", "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Carcinogens Listing", "US EPA High Production Volume Program Chemical List", "US EPA Master Testing List - Index I Chemicals Listed", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List", "US TSCA Section 8 (d) - Health and Safety Data Reporting"

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## Section 15 - REGULATORY INFORMATION

No data for Erapol EMD288RB (CW: 9-31569)

No data for Other ingredients determined not to be hazardous (CAS: , 00000000-00-0)

## Section 16 - OTHER INFORMATION

### Denmark Advisory list for selfclassification of dangerous substances

| Substance                                  | CAS          | Suggested codes |
|--------------------------------------------|--------------|-----------------|
| 4, 4' - diphenylmethane diisocyanate (MDI) | 26447- 40- 5 | R43             |

### INGREDIENTS WITH MULTIPLE CAS NUMBERS

| Ingredient Name                         | CAS                  |
|-----------------------------------------|----------------------|
| 4,4'-diphenylmethane diisocyanate (MDI) | 101-68-8, 26447-40-5 |

■ Classification of the preparation and its individual components has drawn on official and authoritative sources using available literature references.

■ For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:

OSHA Standards - 29 CFR:

1910.132 - Personal Protective Equipment - General requirements

1910.133 - Eye and face protection

1910.134 - Respiratory Protection

1910.136 - Occupational foot protection

1910.138 - Hand Protection

Eye and face protection - ANSI Z87.1

Foot protection - ANSI Z41

Respirators must be NIOSH approved.

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