Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
ERAPOL EME140S ISOYCYANATE PREPOLYMER

PRODUCT USE
Used according to manufacturer's directions.
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: 61 3 9573 3112 ; 800 2436 2255 (INTL)
Fax: 61 2 9666 4805
Email: erapol@erapol.com.au

Section 2 - HAZARDS IDENTIFICATION

GHS Classification
Acute Toxicity (Inhalation) Category 4
Carcinogen Category 2
Eye Irritation Category 2A
Respiratory Sensitizer Category 1
Skin Corrosion/Irritation Category 2
Skin Sensitizer Category 1
STOT - RE Category 2
STOT - SE (Resp. Irr.) Category 3

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.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.

continued...
Section 2 - HAZARDS IDENTIFICATION

PRECAUTIONARY STATEMENTS

Prevention

Code Phrase
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
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.
P281 Use personal protective equipment as required.
P285 In case of inadequate ventilation wear respiratory protection.

Response

Code Phrase
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P304+P341 IF INHALED: If breathing is difficult, remove victim 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.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P332+P313 If skin irritation occurs: Get medical advice/attention.
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.
P362 Take off contaminated clothing and wash before re-use.
P363 Wash contaminated clothing before reuse.

Storage

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

Disposal

Code Phrase
P501 Dispose of contents/container to ...
Section 4 - FIRST AID MEASURES

• Seek medical attention without delay; 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.

**NOTES TO PHYSICIAN**
For sub-chronic and chronic exposures to isocyanates:
- This material may be a potent pulmonary sensitiser 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 vesiculation) and gastrointestinal disturbances occur soon after exposure.
- Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.

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Section 5 - FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA**
- Flooding quantities of water only.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

**FIRE FIGHTING**
- Alert Fire Brigade 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.

**FIRE/EXPLOSION HAZARD**
- Combustible.
- Moderate fire hazard when exposed to heat or flame.
- 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.
  - Combustion products include: carbon dioxide (CO2), isocyanates, and minor amounts of, hydrogen cyanide, nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
  - When heated at high temperatures many isocyanates decompose rapidly generating a vapour which pressurises containers, possibly to the point of rupture. Release of toxic and/or flammable isocyanate vapours may then occur.
  - May emit poisonous fumes.

**FIRE INCOMPATIBILITY**
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.
MINOR SPILLS
• Remove all ignition sources.
• Clean up all spills immediately.
• Avoid breathing vapours and contact with skin and eyes.
• Control personal contact with the substance, by using protective equipment.

MAJOR SPILLS
• Liquid Isocyanates and high isocyanate vapour concentrations will penetrate seals on self contained breathing apparatus - SCBA should be used inside encapsulating suit where this exposure may occur.
• For isocyanate spills of less than 40 litres (2 m2):
  • Evacuate area from everybody not dealing with the emergency, keep them upwind and prevent further access, remove ignition sources and, if inside building, ventilate area as well as possible.
  • Notify supervision and others as necessary.
  • Put on personal protective equipment (suitable respiratory protection, face and eye protection, protective suit, gloves and impermeable boots).
  • Control source of leakage (where applicable).
  • Avoid contamination with water, alkalis and detergent solutions.
  • Material reacts with water and generates gas, pressurises containers with even drum rupture resulting.
  • DO NOT reseal container if contamination is suspected.
  • Open all containers with care.
Moderate hazard.
• Clear area of personnel and move upwind.
• Alert Fire Brigade 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.
  Personal Protective Equipment advice is contained in Section 8 of the MSDS.

PROCEDURE FOR HANDLING
• DO NOT allow clothing wet with material to stay in contact with skin.
• 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.

SUITABLE CONTAINER
• Metal can or drum
• Packaging as recommended by manufacturer.
• Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY
• Avoid reaction with water, alcohols and detergent solutions.
• Isocyanates and thioisocyanates are incompatible with many classes of compounds, reacting exothermically to release toxic gases. Reactions with amines, strong bases, aldehydes, alcohols, alkali metals, ketones, mercaptans, strong oxidisers, hydrides, phenols, and peroxydes can cause vigorous releases of heat. Acids and bases initiate polymerisation reactions in these materials.
• Some isocyanates react with water to form amines and liberate carbon dioxide. This reaction may also generate large volumes of foam and heat. Foaming in confined spaces may produce pressure in confined spaces or containers. Gas generation may pressurise drums to the point of rupture.
• A range of exothermic decomposition energies for isocyanates is given as 20-30 kJ/mol.
• The relationship between energy of decomposition and processing hazards has been the subject of discussion; it is suggested that values of energy released per unit of mass, rather than on a molar basis (J/g) be used in the assessment.
• For example, in "open vessel processes" (with man-hole size openings, in an industrial setting), substances with exothermic decomposition energies below 500 J/g are unlikely to present a danger, whilst those in "closed vessel processes" (opening is a safety valve or bursting disk) present some danger where the decomposition energy exceeds 150 J/g.

continued...
STORAGE REQUIREMENTS
for commercial quantities of isocyanates:
• Isocyanates should be stored in adequately bunded areas. Nothing else should be kept within the same bunding. Pre-polymers need not be segregated. Drums of isocyanates should be stored under cover, out of direct sunlight, protected from rain, protected from physical damage and well away from moisture, acids and alkalis.
• Where isocyanates are stored at elevated temperatures to prevent solidifying, adequate controls should be installed to prevent the high temperatures and precautions against fire should be taken.
• Where stored in tanks, the more reactive isocyanates should be blanketed with a non-reactive gas such as nitrogen and equipped with absorptive type breather valve (to prevent vapour emissions).
• Transfer systems for isocyanates in bulk storage should be fully enclosed and use pump or vacuum systems. Warning signs, in appropriate languages, should be posted where necessary.
• Store in original containers.
• Keep containers securely sealed.
• No smoking, naked lights or ignition sources.
• Store in a cool, dry, well-ventilated area.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

MATERIAL DATA
ERAPOL EME140S ISOCYANATE PREPOLYMER:
Not available

4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI):
for diphenylmethane diisocyanate (methylene bisphenyl isocyanate; MDI)
Odour Threshold Value: 0.39 ppm
IDLH Level: 10 mg/m3
Mean MDI exposures of less than 0.003 ppm appear to have no acute or chronic effect on pulmonary function. MDI produces identical toxicological responses to those produced by TDI and the recommended TLV-TWA is identical for the two isocyanates.

PERSONAL PROTECTION

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

EYE
• Safety glasses with side shields.
• Chemical goggles.
• Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET

NOTE:
• The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
• Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
  The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
  Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
• Isocyanate resistant materials include Teflon, Viton, nitrile rubber and some PVA gloves.
• Protective gloves and overalls should be worn as specified in the appropriate national standard.
• Contaminated garments should be removed promptly and should not be re-used until they have been decontaminated.
• NOTE: Natural rubber, neoprene, PVC can be affected by isocyanates.

OTHER
• Overalls.
• P.V.C. apron.
• Barrier cream.
• Skin cleansing cream.

ENGINEERING CONTROLS
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Milky liquid; reacts with water.

PHYSICAL PROPERTIES
Liquid.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Molecular Weight</td>
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<tr>
<td>Viscosity</td>
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<tr>
<td>Solubility in water (g/L)</td>
<td>Reacts</td>
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<tr>
<td>pH (1% solution)</td>
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<td>Vapour Pressure (kPa)</td>
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<tr>
<td>Specific Gravity (water=1)</td>
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<tr>
<td>Relative Vapour Density</td>
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<tr>
<td>(air=1)</td>
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</tr>
<tr>
<td>Evaporation Rate</td>
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</table>

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
• Presence of elevated temperatures.

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

Section 11 - TOXICOLOGICAL INFORMATION

Health hazard summary table:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Classification</th>
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<tbody>
<tr>
<td>Acute toxicity</td>
<td>Acute Tox. (inhal) 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Skin Irrit. 2</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>Eye Irrit. 2A</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Resp. Sens. 1</td>
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<tr>
<td>Germ cell mutagenicity</td>
<td>Not applicable</td>
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<tr>
<td>Carcinogenicity</td>
<td>Carc. 2</td>
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<tr>
<td>Reproductive toxicity</td>
<td>Not applicable</td>
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<tr>
<td>STOT- single exposure</td>
<td>STOT SE 3</td>
</tr>
</tbody>
</table>

continued...
STOT- repeated exposure
Aspiration hazard

STOT RE 2
Not applicable

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ The material is not thought to produce adverse health effects following ingestion (as classified by EC Directives using animal models).
Neverthelesse, 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 may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation.
Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.

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.

INHALED
■ The material can cause respiratory irritation in some persons.
The body's response to such irritation can cause further lung damage.
■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
■ The vapour/mist may be highly irritating to the upper respiratory tract and lungs; the response may be severe enough to produce bronchitis and pulmonary oedema.
Possible neurological symptoms arising from isocyanate exposure include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression and paranoia.

CHRONIC HEALTH EFFECTS
There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.
Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.
Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.
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.
Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates. [CCTRade-Bayer, APMF].

Isocyanate vapours 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.
Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping.

TOXICITY AND IRRITATION
■ Not available. Refer to individual constituents.

CARCINOGEN
4, 4' - diphenylmethane disiocyanate (MDI)
Australia Exposure Standards Carcinogen Category Sen
International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs Group 3 Not classifiable as to its carcinogenicity to humans

SKIN
continued...
Section 11 - TOXICOLOGICAL INFORMATION

4,4’-diphenylmethane diisocyanate (MDI)  
GESAMP/EHS Composite List - GESAMP Hazard Profiles  
D1: skin irritation/corrosion 2

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-diphenylmethane diisocyanate (MDI)</td>
<td>LOW</td>
<td>LOW</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Section 13 - DISPOSAL CONSIDERATIONS

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area.
A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction.
- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- DO NOT recycle spilled material.
- Consult State Land Waste Management Authority for disposal.
- Neutralise 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 CO2 gas is generated and may pressurise containers.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:
None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, IATA, IMDG

Section 15 - REGULATORY INFORMATION

Indications of Danger:
Xn Harmful

POISONS SCHEDULE S6

REGULATIONS

Regulations for ingredients

4,4’-DIPHENYL METHANE DIISOCYANATE (MDI) (CAS: 101-68-8, 26447-40-5) is found on the following regulatory lists:
"Australia - New South Wales - Work Health and Safety Regulation 2011 - Requirements for health monitoring -Hazardous chemicals (other than lead) requiring health monitoring", "Australia - New South Wales Hazardous Substances Requiring Health Surveillance", 

continued...
Section 15 - REGULATORY INFORMATION


No data for ERAPOL EME140S ISOCYANATE PREPOLYMER (CW: 24-3812)

Section 16 - OTHER INFORMATION

Denmark Advisory list for selfclassification of dangerous substances

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS</th>
<th>Suggested codes</th>
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<tr>
<td>4, 4’- diphenylmethane diisocyanate (MDI)</td>
<td>26447-40-5</td>
<td>R43</td>
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</table>

INGREDIENTS WITH MULTIPLE CAS NUMBERS

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS</th>
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<tr>
<td>4,4’-diphenylmethane diisocyanate (MDI)</td>
<td>101-68-8, 26447-40-5</td>
<td></td>
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</tbody>
</table>

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

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