SECTION 1. IDENTIFICATION

Product name : RENLAM® 4014 US

Manufacturer or supplier’s details
Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America
Telephone : Non-Emergency: (800) 257-5547
E-mail address of person responsible for the SDS : MSDS@huntsman.com
Emergency telephone : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use
Recommended use : Epoxy resin solution

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Skin irritation : Category 2
Serious eye damage : Category 1
Skin sensitization : Category 1
Acute aquatic toxicity : Category 2
Chronic aquatic toxicity : Category 2

GHS Label element
Hazard pictograms :

Signal Word : Danger
Hazard Statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements : Prevention:
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Mixture</th>
</tr>
</thead>
</table>

**Hazardous ingredients**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoxy resin</td>
<td>–</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Phenol, polymer with formaldehyde, glycidyl ether</td>
<td>28064-14-4</td>
<td>13 - 30</td>
</tr>
<tr>
<td>butanedioldiglycidyl ether</td>
<td>2425-79-8</td>
<td>7 - 13</td>
</tr>
<tr>
<td>p-tert-butylphenyl 1-(2,3-epoxy)propyl ether</td>
<td>3101-60-8</td>
<td>1 - 3</td>
</tr>
</tbody>
</table>

**SECTION 4. FIRST AID MEASURES**

**General advice**: No hazards which require special first aid measures.

**If inhaled**: Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician.

**In case of skin contact**: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water.

**In case of eye contact**: Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing.

**If swallowed**: Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: None known.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media: No data is available on the product itself.

Specific extinguishing methods: No data is available on the product itself.

Further information: Standard procedure for chemical fires.

Special protective equipment for fire-fighters: In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Not applicable for product as supplied.

Environmental precautions: No special environmental precautions required.

Methods and materials for containment and cleaning up: Wipe up with absorbent material (e.g. cloth, fleece). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion: Normal measures for preventive fire protection.

Advice on safe handling: For personal protection see section 8. No special handling advice required.

Conditions for safe storage: Keep container tightly closed in a dry and well-ventilated place.

Materials to avoid: No special restrictions on storage with other products.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Personal protective equipment
Respiratory protection: No personal respiratory protective equipment normally required.

Hand protection
Remarks: For prolonged or repeated contact use protective gloves.

Eye protection: Safety glasses

Skin and body protection: Protective suit

Hygiene measures: General industrial hygiene practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: liquid
Color: gray
Odor: No data is available on the product itself.
Odor Threshold: No data is available on the product itself.
pH: No data is available on the product itself.
Flash point: 148.89 °C
   Method: Pensky-Martens closed cup, closed cup
Evaporation rate: No data is available on the product itself.
Flammability (solid, gas): No data is available on the product itself.
Upper explosion limit: No data is available on the product itself.
Lower explosion limit: No data is available on the product itself.
Vapor pressure: 0.0097309 hPa (80 °C)
Relative vapor density: No data is available on the product itself.
Relative density: 1.3 - 1.36
Density: No data is available on the product itself.
Solubility(ies)
Water solubility: negligible
Solubility in other solvents: No data is available on the product itself.
Partition coefficient: n-octanol/water
Autoignition temperature: No data is available on the product itself.
Thermal decomposition: No data is available on the product itself.
Viscosity : No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT) : No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable under recommended storage conditions.
Chemical stability : No decomposition if stored and applied as directed.
Possibility of hazardous reactions : No hazards to be specially mentioned.
Conditions to avoid : No data available

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate: > 40 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Product: Remarks: According to the classification criteria of the European Union, the product is not considered as being a skin irritant.

Serious eye damage/eye irritation

Product: Remarks: According to the classification criteria of the European Union, the product is not considered as being an eye irritant.

Respiratory or skin sensitization

Product: Remarks: No data available
Assessment: No data available

**Germ cell mutagenicity**

**Ingredients:**

Epoxy resin:

Genotoxicity in vitro: Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: positive

Concentration: 0 - 5000 ug/plate

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: positive

Phenol, polymer with formaldehyde, glycidyl ether:

Genotoxicity in vitro: Metabolic activation: with and without metabolic activation

Result: positive

Concentration: 0 - 5000 ug/plate

Metabolic activation: with and without metabolic activation

Result: positive

Butanediol diglycidyl ether:

Genotoxicity in vitro: Concentration: 10 - 5000 ug/plate

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: positive

Concentration: 1 - 100 µg/L

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: positive

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:

Genotoxicity in vitro: Concentration: 50 ug/plate

Metabolic activation: negative

Method: OECD Test Guideline 473

Result: positive

Concentration: 33 ug/plate

Metabolic activation: negative

Method: OECD Test Guideline 471

Result: positive

**Ingredients:**

Epoxy resin:

Genotoxicity in vivo: Cell type: Germ

Application Route: Oral

Method: OECD Test Guideline 478

Result: negative

Cell type: Somatic

Application Route: Oral
Dose: 0 - 5000 mg/kg
Method: OPPTS 870.5395
Result: negative

Phenol, polymer with formaldehyde, glycidyl ether:
Genotoxicity in vivo:
Cell type: Germ
Application Route: Oral
Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 0 - 5000 mg/kg
Result: negative

butanedioldiglycidyl ether:
Genotoxicity in vivo:
Test Type: In vivo micronucleus test
Species: Mouse
Cell type: Somatic
Application Route: Oral
Exposure time: 4 d
Dose: 187.5 - 750 mg/kg
Method: OECD Test Guideline 474
Result: negative

Test Type: unscheduled DNA synthesis assay
Species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

Ingredients:
Epoxy resin:
Germ cell mutagenicity-Assessment:
Weight of evidence does not support classification as a germ cell mutagen.

butanedioldiglycidyl ether:
Germ cell mutagenicity-Assessment:
Weight of evidence does not support classification as a germ cell mutagen.

Germ cell mutagenicity-Assessment:
No data available

Carcinogenicity
Ingredients:
Epoxy resin:
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 24 month(s)
Dose: 15 mg/kg
Frequency of Treatment: 7 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Mouse, (male)
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0.1 mg/kg
Frequency of Treatment: 3 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Rat, (female)
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 1 mg/kg
Frequency of Treatment: 5 days/week
Method: OECD Test Guideline 453
Result: negative

Phenol, polymer with formaldehyde, glycidyl ether:
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 24 month(s)
Dose: 15 mg/kg
Frequency of Treatment: 7 daily
Method: OECD Test Guideline 453
Result: negative

Species: Mouse, (male)
Application Route: Dermal
Exposure time: 24 month(s)
Dose: .1 mg/kg
Frequency of Treatment: 3 daily
Method: OECD Test Guideline 453
Result: negative

Species: Rat, (female)
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 1 mg/kg
Frequency of Treatment: 5 daily
Method: OECD Test Guideline 453
Result: negative

Carcinogenicity -
Assessment : No data available

IARC
Group 2B: Possibly carcinogenic to humans

titanium dioxide

OSHA
No ingredient of this product present at levels greater than or
equal to 0.1% is identified as a carcinogen or potential
carcinogen by OSHA.

NTP
Known to be human carcinogen
Talc (Mg3H2(SiO3)4)

**Reproductive toxicity**

**Ingredients:**

- **Epoxy resin:**
  - **Effects on fertility:**
    - **Test Type:** Two-generation study
    - **Species:** Rat, male and female
    - **Application Route:** Oral
    - **Dose:** >750 milligram per kilogram
    - **General Toxicity Parent:** No-observed-effect level: 540 mg/kg body weight
    - **General Toxicity F1:** No-observed-effect level: 540 mg/kg body weight
    - **Symptoms:** No adverse effects.
    - **Method:** OECD Test Guideline 416
    - **Result:** No effects on fertility and early embryonic development were detected.

- **Phenol, polymer with formaldehyde, glycidyl ether:**
  - **Species:** Rat, male and female
  - **Application Route:** Oral
  - **Method:** OECD Test Guideline 416

**Ingredients:**

- **Epoxy resin:**
  - **Effects on fetal development:**
    - **Species:** Rabbit, female
    - **Application Route:** Dermal
    - **General Toxicity Maternal:** NOAEL (No observed adverse effect level): 30 mg/kg body weight
    - **Method:** Other guidelines
    - **Result:** No teratogenic effects.

  - **Species:** Rabbit, female
    - **Application Route:** Oral
    - **General Toxicity Maternal:** NOAEL (No observed adverse effect level): 60 mg/kg body weight
    - **Method:** OECD Test Guideline 414
    - **Result:** No teratogenic effects.

  - **Species:** Rat, female
    - **Application Route:** Oral
    - **General Toxicity Maternal:** NOAEL (No observed adverse effect level): 180 mg/kg body weight
    - **Method:** OECD Test Guideline 414
    - **Result:** No teratogenic effects.

- **Phenol, polymer with formaldehyde, glycidyl ether:**
  - **Species:** Rabbit, female
    - **Application Route:** Dermal
    - **General Toxicity Maternal:** NOAEL (No observed adverse effect level): 30 mg/kg body weight
    - **Result:** No teratogenic effects.

  - **Species:** Rabbit, female
Application Route: Oral
General Toxicity Maternal: NOAEL (No observed adverse effect level): 60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects.

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: NOAEL (No observed adverse effect level): 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects.

Reproductive toxicity - Assessment: No data available

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Repeated dose toxicity

Ingredients:
Epoxy resin:
Species: Rat, male and female
NOAEL (No observed adverse effect level): 50 mg/kg
Application Route: Ingestion
Exposure time: 14 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
No-observed-effect level: 10 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Species: Mouse, male
NOAEL (No observed adverse effect level): 100 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 3 d
Method: Subchronic toxicity

Phenol, polymer with formaldehyde, glycidyl ether:
Species: Rat, male and female
NOAEL (No observed adverse effect level): 50 mg/kg
Application Route: Ingestion
Exposure time: 14 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
No-observed-effect level: 10 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Species: Mouse, male
NOAEL (No observed adverse effect level): 100 mg/kg
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 3 d
Method: Subchronic toxicity

butanediol diglycidyl ether:
Species: Rat, male and female
NOAEL (No observed adverse effect level): 200 mg/kg
Application Route: Ingestion
Exposure time: 28 d
Number of exposures: 7 d
Method: Subacute toxicity

Repeated dose toxicity - : No data available
Assessment

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available
Skin contact: No data available
Eye contact: No data available
Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available
Further information

**Product:**
Remarks: No data available

### SECTION 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

**Ingredients:**

**Epoxy resin:**
Toxicity to fish: \(\text{LC}_{50}\) (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l
- Exposure time: 96 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 203

**Phenol, polymer with formaldehyde, glycidyl ether:**
Toxicity to fish: \(\text{LC}_{50}\) (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l
- Exposure time: 96 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 203

**Butanediolglycidyl ether:**
Toxicity to fish: \(\text{EC}_{50}\) (Brachydanio rerio (zebrafish)): 24 mg/l
- Exposure time: 96 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 203

**p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:**
Toxicity to fish: \(\text{LC}_{50}\): 7.5 mg/l
- Exposure time: 96 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 203

**Ingredients:**

**Epoxy resin:**
Toxicity to daphnia and other aquatic invertebrates: \(\text{EC}_{50}\) (Daphnia magna (Water flea)): 2.7 mg/l
- Exposure time: 48 h
- Test Type: static test
- Test substance: Fresh water

**Phenol, polymer with formaldehyde, glycidyl ether:**
Toxicity to daphnia and other aquatic invertebrates: \(\text{EC}_{50}\) (Daphnia magna (Water flea)): 1.7 mg/l
- Exposure time: 48 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 202

\(\text{EC}_{50}\) (Daphnia magna (Water flea)): 2.7 mg/l
- Exposure time: 48 h
butanedioldiglycidyl ether:
Toxicity to daphnia and other aquatic invertebrates: 
- EC50 (Daphnia magna (Water flea)): 75 mg/l
- Exposure time: 24 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 202

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Toxicity to daphnia and other aquatic invertebrates: 
- EC50 (Daphnia magna (Water flea)): ca. 67.9 mg/l
- Exposure time: 48 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 202

Ingredients:
Epoxy resin:
Toxicity to algae: 
- EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l
- Exposure time: 72 h
- Test Type: static test
- Test substance: Fresh water
- Method: EPA-660/3-75-009

Phenol, polymer with formaldehyde, glycidyl ether:
Toxicity to algae: 
- EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l
- Exposure time: 72 h
- Test Type: static test
- Test substance: Fresh water

Ingredients:
butanedioldiglycidyl ether:
Toxicity to algae: 
- EL50: > 160 mg/l
- Exposure time: 72 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 201

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Toxicity to algae: 
- EbC50 (Selenastrum capricornutum (green algae)): ca. 9 mg/l
- Exposure time: 72 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity):  
- No data available

Ingredients:
Phenol, polymer with formaldehyde, glycidyl ether:
Toxicity to fish (Chronic toxicity): 
- GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): 0.3 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Phenol, polymer with formaldehyde, glycidyl ether:
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): 0.3 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity): No data available

**Ingredients:**

**Epoxy resin:**
Toxicity to bacteria: IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Phenol, polymer with formaldehyde, glycidyl ether:
Toxicity to bacteria: IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Butanediolglycidyl ether:
Toxicity to bacteria: IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Toxicity to bacteria: EC50: > 1,000 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

Toxicity to soil dwelling organisms: No data available

Plant toxicity: No data available

Sediment toxicity: No data available

Toxicity to terrestrial organisms: No data available

Ecotoxicology Assessment
Acute aquatic toxicity: No data available
Chronic aquatic toxicity: No data available

Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

Further information: No data available

Persistence and degradability

**Ingredients:**

**Epoxy resin:**
Biodegradability: Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5%
Exposure time: 28 d
Method: OECD Test Guideline 301F

**Phenol, polymer with formaldehyde, glycidyl ether:**
Biodegradability: Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 5%
Exposure time: 28 d
Method: OECD Test Guideline 301F

**butanedioldiglycidyl ether:**
Biodegradability: Inoculum: activated sludge
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 43%
Exposure time: 28 d
Method: OECD Test Guideline 301F

**p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:**
Biodegradability: Inoculum: activated sludge
Concentration: 5 mg/l
Result: Not readily biodegradable.
Biodegradation: ca. 1.1%
Exposure time: 28 d
Method: OECD Test Guideline 301D

Biochemical Oxygen Demand (BOD): No data available

Chemical Oxygen Demand (COD): No data available

BOD/COD: No data available

ThOD: No data available
BOD/ThOD: No data available
Dissolved organic carbon (DOC): No data available
Physico-chemical removability: No data available
Stability in water: No data available
Photodegradation: No data available
Impact on Sewage Treatment: No data available

Bioaccumulative potential

**Ingredients:**

**Epoxy resin:**
Bioaccumulation: Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

**Phenol, polymer with formaldehyde, glycidyl ether:**
Bioaccumulation: Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

**Ingredients:**

**Epoxy resin:**
Partition coefficient: n-octanol/water: log Pow: 3.242 (25 °C)
Method: OECD Test Guideline 117

**Phenol, polymer with formaldehyde, glycidyl ether:**
Partition coefficient: n-octanol/water: log Pow: 3.242 (25 °C)
Method: OECD Test Guideline 117

**butanedioldiglycidyl ether:**
Partition coefficient: n-octanol/water: log Pow: -0.269 (25 °C)
Method: OECD Test Guideline 117

**p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:**
Partition coefficient: n-octanol/water: log Pow: 3.59 (20 °C)
Method: OECD Test Guideline 107

**Mobility in soil**

Mobility: No data available

**Ingredients:**

**Epoxy resin:**
Phenol, polymer with formaldehyde, glycidyl ether:

Butanedioldiglycidyl ether:

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:

Stability in soil: No data available

Other adverse effects
Environmental fate and pathways: No data available

Results of PBT and vPvB assessment: No data available

Endocrine disrupting potential: No data available

Adsorbed organic bound halogens (AOX): No data available

Hazardous to the ozone layer
Ozone-Depletion Potential: Not applicable

Additional ecological information - Product:
Global warming potential (GWP): There is no data available for this product.
Adsorbed organic bound halogens (AOX): No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging: Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulation

IATA
UN/ID No.: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)

Class: 9
Packing group: III
Labels: Miscellaneous

Packing instruction (cargo aircraft): 964
Packing instruction (passenger aircraft): 964

IMDG
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)

Class: 9
Packing group: III
Labels: 9
EmS Code: F-A, S-F
Marine pollutant: yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

DOT Classification
UN/ID/NA number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)

Class: 9
Packing group: III
Labels: CLASS 9
ERG Code: 171
Marine pollutant: yes (BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC RESIN)

SECTION 15. REGULATORY INFORMATION

TSCA - 5(a) Significant New Use Rule List of Chemicals: Not relevant

California Prop 65: This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

The ingredients of this product are reported in the following inventories:
Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

NFPA:  

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Special hazard.

HMIS III:

<table>
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<tr>
<th>HEALTH</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>FLAMMABILITY</td>
<td>1</td>
</tr>
<tr>
<td>PHYSICAL HAZARD</td>
<td>0</td>
</tr>
</tbody>
</table>

0 = not significant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme, * = Chronic

Revision Date : 10/24/2015

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE. THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards,
toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.
SECTION 1. IDENTIFICATION

Product name : REN® 1500 US

Manufacturer or supplier’s details
Company name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980
The Woodlands,
TX  77387
United States of America
Telephone : Non-Emergency: (800) 257-5547
E-mail address of person responsible for the SDS : MSDS@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use
Recommended use : Hardener

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Acute toxicity (Dermal) : Category 4
Skin corrosion : Category 1B
Serious eye damage : Category 1
Skin sensitisation : Category 1
Acute aquatic toxicity : Category 3
Chronic aquatic toxicity : Category 3

GHS label elements
Hazard pictograms :

Signal word : Danger
Hazard statements : H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : Prevention:
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of
the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/
face protection.

Response:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT
induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately
all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air
and keep comfortable for breathing. Immediately call a POISON
CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with
water for several minutes. Remove contact lenses, if present
and easy to do. Continue rinsing. Immediately call a POISON
CENTER/doctor.
P333 + P313 If skin irritation or rash occurs: Get medical advice/
attention.
P363 Wash contaminated clothing before reuse.

Storage:
P405 Store locked up.

Disposal:
P501 Dispose of contents/ container to an approved waste
disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>triethylenetetramine</td>
<td>112-24-3</td>
<td>30 - 60</td>
</tr>
<tr>
<td>metaxylenediamine</td>
<td>1477-55-0</td>
<td>13 - 30</td>
</tr>
<tr>
<td>1-methylimidazole</td>
<td>616-47-7</td>
<td>3 - 7</td>
</tr>
<tr>
<td>2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine</td>
<td>25513-64-8</td>
<td>0.1 - 1</td>
</tr>
</tbody>
</table>

The specific chemical identity and/or exact percentage (concentration) of composition has been
withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious place in recovery position and seek medical
advice.
If symptoms persist, call a physician.

In case of skin contact: Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact: Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed: Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

Most important symptoms and effects, both acute and delayed: None known.

Notes to physician: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media: No data is available on the product itself.

Unsuitable extinguishing media: High volume water jet

Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products: No data is available on the product itself.

Specific extinguishing methods: No data is available on the product itself.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures:** Use personal protective equipment.

**Environmental precautions:** Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

**Methods and materials for containment and cleaning up:** Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

**SECTION 7. HANDLING AND STORAGE**

**Advice on protection against fire and explosion:** Normal measures for preventive fire protection.

**Advice on safe handling:** Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

**Conditions for safe storage:** Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of)</th>
<th>Control parameters / Basis</th>
</tr>
</thead>
</table>

SDS_US-AM – EN – 400001010557
**Engineering measures**

Maintain air concentrations below occupational exposure standards.

**Personal protective equipment**

Respiratory protection:
- When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
- No personal respiratory protective equipment normally required.

Hand protection:
- The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection:
- Eye wash bottle with pure water
- Tightly fitting safety goggles
- Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection:
- Impervious clothing
- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures:
- When using do not eat or drink.
- When using do not smoke.
- Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance**: liquid

**Colour**: light yellow

**Odour**: No data is available on the product itself.

**Odour Threshold**: No data is available on the product itself.

**pH**: No data is available on the product itself.

**Boiling point**: > 204 °C

**Flash point**: > 110 °C

**Evaporation rate**: No data is available on the product itself.

**Flammability (solid, gas)**: No data is available on the product itself.

**Flammability (liquids)**: No data is available on the product itself.
Upper explosion limit: No data is available on the product itself.
Lower explosion limit: No data is available on the product itself.
Vapour pressure: No data is available on the product itself.
Relative vapour density: No data is available on the product itself.
Relative density: 1.04
Density: No data is available on the product itself.
Solubility(ies)
  Water solubility: No data is available on the product itself.
  Solubility in other solvents: No data is available on the product itself.
Partition coefficient: n-octanol/water: No data is available on the product itself.
Auto-ignition temperature: No data is available on the product itself.
Thermal decomposition: No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT): No data is available on the product itself.
Viscosity: No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY
Reactivity: No decomposition if stored and applied as directed.
Chemical stability: No decomposition if stored and applied as directed.
 Possibility of hazardous reactions: No decomposition if stored and applied as directed.
Conditions to avoid: No data available

SECTION 11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure: No data is available on the product itself.

Acute toxicity
Acute oral toxicity - Product: Acute toxicity estimate: 2,043 mg/kg
                     Method: Calculation method

Acute inhalation toxicity - Product: Acute toxicity estimate: 9.31 mg/l
                   Exposure time: 4 h
                   Test atmosphere: dust/mist
                   Method: Calculation method

Acute dermal toxicity - : Acute toxicity estimate: 1,477 mg/kg
Product: Calculation method

Acute toxicity (other routes of administration):
No data available

Skin corrosion/irritation

Product: Extremly corrosive and destructive to tissue.

Serious eye damage/eye irritation

Product: May cause irreversible eye damage.

Respiratory or skin sensitisation

Product: Causes sensitisation.

Components:
metaxylenediamine: Harmful if swallowed or if inhaled, May be harmful in contact with skin., Causes severe skin burns and eye damage. May cause an allergic skin reaction.

Germ cell mutagenicity

Components:
triethylenetetramine: Genotoxicity in vitro
Concentration: 0 - 200 µg/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

metaxylenediamine: Genotoxicity in vitro
Test Type: Ames test
Species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: Chromosome aberration test in vitro
Species: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Test Type: In vitro mammalian cell gene mutation test
Species: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

1-methylimidazole:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Genotoxicity in vitro: Test Type: Ames test
Species: Salmonella typhimurium
Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Species: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vitro: Test Type: In vitro mammalian cell gene mutation test
Species: Chinese hamster ovary cells
Concentration: 2 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Components:
triethylenetetramine:
Genotoxicity in vivo: Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

metaxylenediamine:
Genotoxicity in vivo: Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Oral
Exposure time: single dose
Dose: 750 mg/kg body weight
Method: OECD Test Guideline 474
Result: negative
GLP: yes
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Genotoxicity in vivo
  Species: Chinese hamster (male and female)
  Cell type: Bone marrow
  Application Route: Oral
  Dose: 825 - 1000 mg/kg
  Method: OECD Test Guideline 474
  Result: negative

  Test Type: In vivo micronucleus test
  Species: Mouse (male and female)
  Application Route: Oral
  Dose: 850 - 1000 mg/kg
  Method: OECD Test Guideline 474
  Result: negative

Components:
metaxylenediamine:
  Germ cell mutagenicity-Assessment
    Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Animal testing did not show any mutagenic effects.

Germ cell mutagenicity-Assessment
  No data available

Carcinogenicity
Components:
triethylenetetramine:
  Species: Mouse, (male)
  Application Route: Dermal
  Dose: 42 mg/kg
  Frequency of Treatment: 3 days/week
  Method: OECD Test Guideline 451
  Result: negative

  Species: Mouse, (male)
  Application Route: Dermal
  Exposure time: 104 weeks
  Dose: 16.8 mg/kg
  Frequency of Treatment: 3 days/week
  Method: OECD Test Guideline 451

Carcinogenicity - Assessment
  No data available

IARC
  No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
  No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP
  No component of this product present at levels greater than or
equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Species:</th>
<th>Application Route:</th>
<th>Dose:</th>
<th>General Toxicity Parent: No-observed-effect level:</th>
<th>General Toxicity F1: No-observed-effect level:</th>
<th>Method:</th>
<th>Result:</th>
</tr>
</thead>
<tbody>
<tr>
<td>metaxylenediamine:</td>
<td>Rat, male and female</td>
<td>Oral</td>
<td>0, 50, 150 and 450 mg/kg</td>
<td>50 - 150 mg/kg body weight</td>
<td>450 mg/kg body weight</td>
<td>OECD Test Guideline 421</td>
<td>No effects on fertility and early embryonic development were detected. GLP: yes</td>
</tr>
<tr>
<td>1-methylimidazole:</td>
<td>Rat, male and female</td>
<td>Oral</td>
<td></td>
<td></td>
<td></td>
<td>OECD Test Guideline 422</td>
<td>No effects on fertility and early embryonic development were detected.</td>
</tr>
<tr>
<td>2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:</td>
<td>Rat, male and female</td>
<td>Oral</td>
<td>10, 60, 120 mg/kg bw/day</td>
<td></td>
<td></td>
<td>OECD Test Guideline 416</td>
<td>No effects on fertility and early embryonic development were detected.</td>
</tr>
<tr>
<td>triethylenetetramine:</td>
<td>Rat</td>
<td>Oral</td>
<td></td>
<td></td>
<td></td>
<td>OECD Test Guideline 414</td>
<td>No teratogenic effects</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
<td>Dermal</td>
<td></td>
<td></td>
<td></td>
<td>OECD Test Guideline 414</td>
<td>No teratogenic effects</td>
</tr>
<tr>
<td>2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:</td>
<td>Rabbit female</td>
<td>Oral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50,000 ppm</td>
</tr>
</tbody>
</table>
Result: No teratogenic effects

Components:
metaxylenediamine:
Reproductive toxicity - Assessment: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

STOT - single exposure
No data available

STOT - repeated exposure
No data available

Repeated dose toxicity
Components:
triylenetetramine:
Species: Rat, male and female
NOAEL: 50 mg/kg/d
Application Route: Ingestion
Exposure time: 26 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

metaxylenediamine:
Species: Rat, male and female
NOEL: 150 mg/kg
Application Route: oral (gavage)
Exposure time: 672 h
Number of exposures: 7 d
Dose: 0, 10, 40, 150 and 600 mg/kg/d
Method: OECD Test Guideline 407
GLP: yes

Species: Rat, male and female
: 0.6 mg/m3
Application Route: Inhalation
Exposure time: 13 weeks
Number of exposures: 6 hours per day, 5 days per we
Dose: 0, 0.64, 5.1, 31 mg/m3
Method: OECD Test Guideline 413
GLP: yes
Target Organs: Lungs

1-methylimidazole:
Species: Rat, male and female
NOAEL: 30 mg/kg/d
Application Route: Ingestion
Number of exposures: 7 d
Method: Subacute toxicity
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Species: Rat, male and female
NOAEL: 10 mg/kg bw/day
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: Daily
Dose: 10, 60, 180mg/kg bw
Target Organs: Liver

Species: Rat, male and female
LOAEL: 60 mg/kg bw/day
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: Daily
Dose: 10, 60, 180mg/kg bw
Target Organs: Liver

**Components:**
me"taxylenediamine:
Repeated dose toxicity - Assessment: Harmful if swallowed or if inhaled, May be harmful in contact with skin, Causes severe skin burns and eye damage.
No adverse effect has been observed in chronic toxicity tests.

**Aspiration toxicity**
No data available

**Experience with human exposure**
General Information: No data available

Inhalation: No data available
Skin contact: No data available
Eye contact: No data available
Ingestion: No data available

**Toxicology, Metabolism, Distribution**
No data available

**Neurological effects**
No data available

**Further information**

**Product:**
Remarks: No data available
SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

triethylenetetramine:
Toxicity to fish:
LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: Fish Acute Toxicity Test

metaxylenediamine:
Toxicity to fish:
LC50 (Oryzias latipes (Orange-red killifish)): 87.6 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203
GLP: yes

1-methylimidazole:
Toxicity to fish:
LC50 (Leuciscus idus (Golden orfe)): > 100 - < 215 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Toxicity to fish:
LC50 (Leuciscus idus (Golden orfe)): 174 mg/l
Exposure time: 48 h
Method: DIN 38412

Components:

triethylenetetramine:
Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 31.1 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

metaxylenediamine:
Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 15.2 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
GLP: yes

1-methylimidazole:
Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 267.9 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 31.5 mg/l
Exposure time: 24 h
Method: DIN 38412

Components:
triethylenetetramine:  
Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l
Exposure time: 72 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 201

metaxylenediamine:  
Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): 32.1 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes

1-methylimidazole:  
Toxicity to algae: ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 180.7 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:  
Toxicity to algae: ErC50 (Pseudokirchneriella subcapitata (algae)): 43.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (algae)): 37.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (algae)): 16 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity): No data available

Components:
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:  
Toxicity to fish (Chronic toxicity): NOEC (Brachydanio rerio (zebrafish)): 10.9 mg/l
Exposure time: 30 d
Method: OECD Test Guideline 201

Lowest Observed Effect Concentration (Brachydanio rerio (zebrafish)): 10.9 mg/l
Exposure time: 30 d
Method: OECD Test Guideline 201
Components:

triethylenetetramine:  
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):  
EC10 (Daphnia magna (Water flea)): 1.9 mg/l  
Exposure time: 21 d  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

metaxylenediamine:  
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):  
NOEC (Daphnia magna (Water flea)): 4.7 mg/l  
Exposure time: 21 d  
Test Type: semi-static test  
Method: OECD Test Guideline 211  
GLP: yes

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:  
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):  
NOEC (Daphnia magna (Water flea)): 1.02 mg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity):  
No data available

Components:

triethylenetetramine:  
Toxicity to bacteria:  
EC50 (activated sludge): 800 mg/l  
Exposure time: 0.5 h  
Test Type: static test  
Test substance: Fresh water

metaxylenediamine:  
Toxicity to bacteria:  
EC50 (activated sludge): > 1,000 mg/l  
Exposure time: 0.5 h  
Test Type: static test  
Method: OECD Test Guideline 209  
GLP: yes

1-methylimidazole:  
Toxicity to bacteria:  
EC50 (activated sludge): 1,050 mg/l  
Exposure time: 7 h  
Method: DIN 38 412 Part 8

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:  
Toxicity to bacteria:  
IC50 (Pseudomonas putida): 89 mg/l  
Exposure time: 17 h
Toxicity to soil dwelling organisms: NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

EC50 (Eisenia fetida (earthworms)): >= 1,000 mg/kg
Exposure time: 56 d
Method: OECD Test Guideline 222

Plant toxicity: No data available

Sediment toxicity: No data available

Toxicity to terrestrial organisms: No data available

Ecotoxicology Assessment
Acute aquatic toxicity: No data available

Chronic aquatic toxicity: No data available

Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

Further information: No data available

Persistence and degradability

Components:
triethylenetetramine: Biodegradability
  Inoculum: activated sludge
  Result: Not readily biodegradable.
  Biodegradation: 0 %
  Exposure time: 162 d
  Method: OECD Test Guideline 301D

  Inoculum: activated sludge
  Result: Not readily biodegradable.
  Biodegradation: 20 %
  Exposure time: 84 d
  Method: Inherent Biodegradability: Modified SCAS Test

metaxylenediamine: Biodegradability
  Concentration: 14.2 mg/l
  Result: Not readily biodegradable.
  Biodegradation: 49 %
  Exposure time: 28 d
  Method: OECD Test Guideline 301B
  GLP: yes

1-methylimidazole: Biodegradability
  Inoculum: activated sludge
  Result: Not readily biodegradable.
Biodegradation: 0 - 10 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Inoculum: activated sludge
Concentration: 9,000 mg/l
Result: Inherently biodegradable.
Biodegradation: 79 %
Exposure time: 60 d
Method: ISO Method, other

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Biodegradability: Inoculum: activated sludge
Concentration: 11.4 mg/l
Result: Not readily biodegradable.
Biodegradation: 7 %
Exposure time: 28 d

Biochemical Oxygen Demand (BOD): No data available

Chemical Oxygen Demand (COD): No data available

BOD/COD: No data available

ThOD: No data available

BOD/ThOD: No data available

Dissolved organic carbon (DOC): No data available

Physico-chemical removability: No data available

Stability in water: No data available

Photodegradation: No data available

Impact on Sewage Treatment: No data available

Bioaccumulative potential

**Components:**
metaxylenediamine: Species: Cyprinus carpio (Carp)
Bioaccumulation: Bioconcentration factor (BCF): < 0.3
Remarks: Does not bioaccumulate.

**Components:**
triethylenetetramine: log Pow: -2.65 (20 °C)
octanol/water
Partition coefficient: n-octanol/water
Method: OECD Test Guideline 117
log Pow: 0.18 (25 °C)
pH: 10.3 - 10.4
Method: OECD Test Guideline 107
GLP: yes

1-methylimidazole:
Partition coefficient: n-octanol/water
Method: OECD Test Guideline 107
log Pow: -0.19 (25 °C)
pH: 9.25 - 9.85

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Partition coefficient: n-octanol/water
Method: OECD Test Guideline 117
log Pow: -0.3 (25 °C)

Mobility in soil
Mobility: No data available

Components:
triethylenetetramine:
Distribution among environmental compartments
Koc: 1584.9 - 5012
Method: OECD Test Guideline 106

1-methylimidazole:
Distribution among environmental compartments
Koc: 27
Method: Calculation method
Stability in soil: No data available

Other adverse effects
Environmental fate and pathways: No data available

Results of PBT and vPvB assessment: No data available
Endocrine disrupting potential: No data available
Adsorbed organic bound halogens (AOX): No data available

Hazardous to the ozone layer
Ozone-Depletion Potential: Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information - Product: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

Global warming potential (GWP) : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulation

IATA
UN/ID No. : UN 2735
Proper shipping name : Polyamines, liquid, corrosive, n.o.s. (TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE)
Class : 8
Packing group : II
Labels : Corrosive
Packing instruction (cargo aircraft) : 855
Packing instruction (passenger aircraft) : 851

IMDG
UN number : UN 2735
Proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S. (TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE)
Class : 8
Packing group : II
Labels : 8
EmS Code : F-A, S-B
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations
DOT Classification
UN/ID/NA number : UN 2735
Proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(TRIETHYLENE TETRAMINE, M-XYLYLENE DIAMINE)
Class : 8
Packing group : II
Labels : CORROSIVE
ERG Code : 153
Marine pollutant : no

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act
SARA 311/312 Hazards : Acute Health Hazard
SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65 : This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:
CH INV : The formulation contains substances listed on the Swiss Inventory, Not in compliance with the inventory
TSCA : On the inventory, or in compliance with the inventory
DSL : All components of this product are on the Canadian DSL
AICS : Not in compliance with the inventory
NZIoC : not determined
ENCS : Low volume exemption, On the inventory, or in compliance with the inventory
KECI : On the inventory, or in compliance with the inventory
PICCS : On the inventory, or in compliance with the inventory
IECSC : On the inventory, or in compliance with the inventory
TCGI : On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECl (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Further information

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HMIS III:

- HEALTH: 3
- FLAMMABILITY: 1
- PHYSICAL HAZARD: 1

0 = not significant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme, * = Chronic

Revision Date: 06/02/2016

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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