SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product information

Commercial name: ECA 100
Trade Name: ECA 100; Epoxy Curing Agent 100
EC Number: Mixture
CAS Number: Mixture

1.2 Relevant identified uses of the substance or mixture and uses advised against

Industrial use as an intermediate in chemical synthesis or process
Industrial use as a hardener for epoxy resins
Industrial use as a monomer in the manufacture of resins
Manufacture of substance (liquid and flakes)

1.3 Details of the supplier of the safety data sheet

Dixie Chemical
Phone: 281-474-3271
Email: msds@dixiechemical.com

REACH ChemAdvice GmbH
Am Marktplatz 5 - 65779 Kelkheim (Taunus) - Germany
Tel.: +49 (0) 6195 96199 14
Fax: +49 (0) 6195 96199 33
E-mail address: rudolf.staab@reach-chemadvice.com

1.4 Emergency telephone number

Information (281) 474-3271
Chemtrec (800) 424-9300

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to EU Directives 1272/2008

Eye Damage 1-H318: Causes serious eye damage.
Resp. Sensitizer- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sensitizer1 -H317: May cause an allergic skin reaction.
Aquatic Chronic 3 - H412: Harmful to aquatic life with long lasting effects

2.1.2 Classification according to Directive 67/548/EEC

Xi -Irritant; R41 - Risk of serious damage to eyes.
Xn -Harmful; R42/43 - May cause sensitization by inhalation and skin contact.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

2.2. Label elements

2.2.1 Labeling according to Regulation (EC) 1272/2008

Signal word: Danger
Hazard pictogram:
GHS08: health hazard
GHS05: corrosion

Hazard Statement(s):
  H317: May use an allergic skin reaction
  H318: Causes serious eye damage
  H334: May cause allergy or asthma symptoms or breathing difficulty if inhaled
  H412: Harmful to aquatic life with long lasting effects

Precautionary Statement(s):

P280: Wear protective gloves/protective clothing/eye protection/face protection.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P285: In case of inadequate ventilation wear respiratory protection.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.
P304+P341: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
P321: Specific treatment (see... on this label).
P363: Wash contaminated clothing before reuse.
P501: Dispose of contents/container to...
2.2.2 Classification and labelling in Annex I of Directive 67/548/EEC

Labeling

Indication of danger:
Xn - harmful

R-phrases:
R41 - risk of serious damage to eyes
R42/43 - may cause sensitization by inhalation and skin contact
R52/53 - harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

S-phrases:
S2 - keep out of the reach of children
S22 - do not breathe dust
S24 - avoid contact with skin
S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37/39 - wear suitable gloves and eye/face protection
S61 - avoid release to the environment. refer to special instructions/safety data sheets

2.3 Other hazards
No other known.
For PBT and/or vPvB see section 12.5

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures
[Chemical nature of the mixture] :

<table>
<thead>
<tr>
<th>CAS/EU number/REACH Registration Number</th>
<th>Chemical name of the substance</th>
<th>Concentration</th>
<th>Classification according to Regulation (EU) 1272/2008(CLP)</th>
<th>Classification according to EU Directives 67/548/EEC or 1999/45/EC</th>
</tr>
</thead>
</table>
Further information
For the full text of the H-Statements mentioned in this Section, see Section 16.
For the full text of the R-phrases mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation:
Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration.
If symptoms persist, call a physician.

Skin:
After contact with skin, wash immediately with plenty of soap and water. Consult a physician.

Eye:
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Call a physician immediately.

Ingestion:
Call a physician immediately. Clean mouth with water and drink afterwards plenty of water.
Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed
There is no data available for this product.

4.3 Indication of immediate medical attention and special treatment needed, if necessary
See Section 4.1

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Extinguishing media:
Water spray
Carbon dioxide (CO2)
Alcohol-resistant foam

Unsuitable extinguishing media:
High volume water jet
5.2 **Hazardous combustion products:** Carbon dioxide and carbon monoxide may form by combustion. In contact with hot water may form phthalic acid.

5.3 **Special protective actions for fire-fighters**

   Wear self-contained breathing apparatus and protective suit.

5.4 **Specific methods**

   In the event of fire, cool tanks with water spray. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. **ACCIDENTAL RELEASE MEASURES**

6.1 **Personal precautions, protective equipment and emergency procedures**

   Move any people not authorized to contain the emergency out of the area.
   Avoid coming in contact with the substance or handling containers without adequate protection.
   Use the personal protective equipment described in section 8.
   Use a respirator in the event of emissions/spillage of large quantities.
   Eliminate all sources of ignition.
   Remove all incompatible materials as outlined in section 10.5 of SDS.
   Avoid dust formation.

6.2 **Environmental precautions**

   Try to prevent the material from entering drains or water courses. Local authorities should be advised if significant spillages cannot be contained.

6.3 **Methods and materials for containment and cleaning up**

   Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). After cleaning, flush away traces with water.

7. **HANDLING AND STORAGE**

7.1 **Precautions for safe handling**

   Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. For personal protection see section 8.

7.2 **Conditions for safe storage, including any incompatibilities**

   Eliminate all sources of combustion.
   Keep container hermetically closed in a dry and well ventilated environment.
   Do not store near heat sources or expose to direct sunlight, to preserve the quality of the product.
   Keep away from incompatible materials (see point 10.5).
   Keep away from food, feed and beverages.
### 7.3 Specific end uses
None

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Ecotoxicological information Compartments</th>
<th>PEC (local + regional)</th>
<th>PNEC</th>
<th>PEC/PNEC</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>2.78E-03 mg/l</td>
<td>0.0653 mg/l</td>
<td>4.26E-02</td>
<td>RCR &lt; 1: risk considered to be controlled</td>
</tr>
<tr>
<td>Marine water</td>
<td>1.08E-03 mg/l</td>
<td>6.53E-03 mg/l</td>
<td>1.65E-01</td>
<td>RCR &lt; 1: risk considered to be controlled Regional impact only (no releases to marine environment)</td>
</tr>
<tr>
<td>Sediment</td>
<td>4.91E-03 mg/kg</td>
<td>0.122 mg/kg</td>
<td>4.02E-02</td>
<td>RCR &lt; 1: risk considered to be controlled</td>
</tr>
</tbody>
</table>

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<th>Compartments PEC (local + regional)</th>
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<th>Discussion</th>
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</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>8.64E-03 mg/l</td>
<td>0.0653 mg/l</td>
<td>1.32E-01</td>
</tr>
<tr>
<td>Marine water</td>
<td>9.70E-04 mg/l</td>
<td>6.53E-03 mg/l</td>
<td>1.49E-01</td>
</tr>
<tr>
<td>Sediment</td>
<td>5.62E-03 mg/kg</td>
<td>0.122 mg/kg</td>
<td>4.60E-02</td>
</tr>
</tbody>
</table>

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<th>PEC/PNEC</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural soil</td>
<td>2.81E-02 mg/kg</td>
<td>0.159 mg/kg</td>
<td>1.77E-01</td>
</tr>
<tr>
<td>Grassland</td>
<td>5.56E-03 mg/kg</td>
<td>0.159 mg/kg</td>
<td>3.50E-02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Route Total daily intake for humans (Estimated values by EUSES)</th>
<th>Unit</th>
<th>Long-term DNEL Oral, systemic</th>
<th>Unit</th>
<th>total daily intake/DNEL</th>
<th>Discussion</th>
</tr>
</thead>
</table>
### 8.1 Exposure Limit Values

#### Toxicological information

<table>
<thead>
<tr>
<th>Exposure pattern</th>
<th>Route</th>
<th>Descriptor</th>
<th>DNEL / DMEL</th>
<th>(Corrected) Dose descriptor *)</th>
<th>Most sensitive endpoint</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute - systemic effects</td>
<td>Dermal</td>
<td>DNEL (Derived No Effect Level)</td>
<td>4.15 mg/kg bw/day</td>
<td>NOAEL: 249.00 mg/kg bw/day (based on AF of 60)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term dermal was 250 mg/kg bw/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and assuming 100% absorption through the skin. Default assessment factors used as follows: Penetration -1; interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in workers - 5; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 300, reduced by factor of 5 for short term exposure.</td>
</tr>
<tr>
<td>Acute - systemic effects</td>
<td>Inhalation</td>
<td>DNEL (Derived No Effect Level)</td>
<td>29.39 mg/m³</td>
<td>NOAEC: 440.85 mg/m³ (based on AF of 15)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term inhalation was 441 mg/m³/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and correcting the starting point in accordance with TGD. Default assessment factors used as follows: remaining interspecies differences - 2.5; intraspecies differences in workers - 5; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 75, reduced by factor of 5 for short term exposure.</td>
</tr>
<tr>
<td>Acute - Dermal</td>
<td>No-</td>
<td>Sensitization</td>
<td></td>
<td></td>
<td>Sensitization is regarded as controlled</td>
<td></td>
</tr>
</tbody>
</table>

| Oral     | 2.07E-02 | [mg.kg-1.d-1] | 0.42     | [mg.kg-1.d-1] | 4.92E-02 | RCR < 1: risk considered to be controlled |

SDS ECA 100  
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<table>
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<tbody>
<tr>
<td>local effects</td>
<td></td>
<td>threshold</td>
<td></td>
<td></td>
<td>(skin)</td>
<td>an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
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<tr>
<td></td>
<td></td>
<td>effect and/or no dose-response information available</td>
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</tr>
<tr>
<td>Acute - local effects</td>
<td>Inhalation</td>
<td>No-threshold effect and/or no dose-response information available</td>
<td>mg/m³</td>
<td>sensitization (respiratory tract)</td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
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</tr>
<tr>
<td>Long-term - systemic effects</td>
<td>Dermal</td>
<td>DNEL (Derived No Effect Level)</td>
<td>0.83 mg/kg bw/day</td>
<td>NOAEL: 249.00 mg/kg bw/day (based on AF of 300)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term dermal was 250 mg/kg bw/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and assuming 100% absorption through the skin. Default assessment factors used as follows: Penetration -1; interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in workers - 5; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 300</td>
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<tr>
<td>Long-term - systemic effects</td>
<td>Inhalation</td>
<td>DNEL (Derived No Effect Level)</td>
<td>5.88 mg/m³</td>
<td>NOAEC: 441.00 mg/m³ (based on AF of 75)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term inhalation was 441 mg/m³/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and correcting the starting point in accordance with TGD. Default assessment factors used as follows: remaining interspecies differences - 2.5; intra-species differences in workers - 5;</td>
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<td></td>
<td></td>
<td>sensitization (skin)</td>
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<td>No-threshold effect and/or no dose-response information available</td>
<td></td>
<td></td>
<td>developmental toxicity / teratogenicity</td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
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*) The (corrected) dose descriptor starting points have been automatically calculated by multiplying the values of the fields "D(N)MEL" and "Assessment factor" provided in the Endpoint summary of IUCLID section 7. Toxicological information. It reflects the value after any corrections, e.g. route-to-route extrapolation. See column "Justification" for the rationale behind such modifications and the use of assessment factors.

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<tbody>
<tr>
<td>Acute - systemic effects</td>
<td>Dermal</td>
<td>DNEL (Derived No Effect Level)</td>
<td>2.08 mg/kg bw/day</td>
<td>NOAEL: 249.60 mg/kg bw/day (based on AF of 120)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term dermal was 250 mg/kg bw/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and assuming 100% absorption through the skin. Default assessment factors used as follows: Penetration -1; interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure</td>
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</tr>
<tr>
<td>Acute - systemic effects</td>
<td>Inhalation</td>
<td>DNEL (Derived No Effect Level)</td>
<td>7.25 mg/m³</td>
<td>NOAEC: 217.50 mg/m³ (based on AF of 30)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term inhalation was 217 mg/m³/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and correcting the starting point in accordance with TGD. Default assessment factors used as follows: remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 150, reduced by factor of 5 for short term exposure</td>
</tr>
<tr>
<td>Acute - systemic effects</td>
<td>Oral</td>
<td>DNEL (Derived No Effect Level)</td>
<td>2.08 mg/kg bw/day</td>
<td>NOAEL: 249.60 mg/kg bw/day (based on AF of 120)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term oral was 250 mg/kg bw/day for reproductive effects. Default assessment factors used as follows: Interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 600, reduced by factor of 5 for short term exposure</td>
</tr>
<tr>
<td>Acute - local effects</td>
<td>Dermal</td>
<td>No-threshold effect and/or no dose-</td>
<td>NOAEL: sensitization (skin)</td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
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*) Most sensitive endpoint

<table>
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<th>Exposure pattern</th>
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<td>Inhalation</td>
<td>DNEL (Derived No Effect Level)</td>
<td>7.25 mg/m³</td>
<td>NOAEC: 217.50 mg/m³ (based on AF of 30)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term inhalation was 217 mg/m³/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and correcting the starting point in accordance with TGD. Default assessment factors used as follows: remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 150, reduced by factor of 5 for short term exposure</td>
</tr>
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<td>Acute - systemic effects</td>
<td>Oral</td>
<td>DNEL (Derived No Effect Level)</td>
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<td>The NOAEL long-term oral was 250 mg/kg bw/day for reproductive effects. Default assessment factors used as follows: Interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 600, reduced by factor of 5 for short term exposure</td>
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<tr>
<td><strong>Acute - local effects</strong></td>
<td>Inhalation</td>
<td>No-threshold effect and/or no dose-response information available</td>
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<td>sensitization (respiratory tract)</td>
<td></td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
</tr>
<tr>
<td><strong>Long-term - systemic effects</strong></td>
<td>Dermal</td>
<td>DNEL (Derived No Effect Level)</td>
<td>0.42 mg/kg bw/day</td>
<td>NOAEL: 252.00 mg/kg bw/day (based on AF of 600)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term dermal was 250 mg/kg bw/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and assuming 100% absorption through the skin. Default assessment factors used as follows: Penetration -1; interspecies differences rat/human - 4; remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6; reliability of dose response - 1; quality of data - 1. Total AF = 600</td>
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<tr>
<td><strong>Long-term - systemic effects</strong></td>
<td>Inhalation</td>
<td>DNEL (Derived No Effect Level)</td>
<td>1.45 mg/m³</td>
<td>NOAEC: 217.50 mg/m³ (based on AF of 150)</td>
<td>developmental toxicity / teratogenicity</td>
<td>The NOAEL long-term inhalation was 217 mg/m3/day, calculated from the NOAEL oral of 250 mg/kg bw/day for reproductive effects and correcting the starting point in accordance with TGD. Default assessment factors used as follows: remaining interspecies differences - 2.5; intraspecies differences in general population - 10; extrapolation of exposure duration - 6;</td>
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</tr>
<tr>
<td>Long-term - local effects</td>
<td>Dermal</td>
<td>No-threshold effect and/or no dose-response information available</td>
<td></td>
<td>sensitization (skin)</td>
<td></td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
</tr>
<tr>
<td>Long-term - local effects</td>
<td>Inhalation</td>
<td>No-threshold effect and/or no dose-response information available</td>
<td></td>
<td>sensitization (respiratory tract)</td>
<td></td>
<td>Sensitization is regarded as an effect for which a threshold (no effect) exposure cannot be determined. As a result a DNEL cannot be derived</td>
</tr>
</tbody>
</table>

*) The (corrected) dose descriptor starting points have been automatically calculated by multiplying the values of the fields "D(N)MEL" and "Assessment factor" provided in the Endpoint summary of IUCLID section 7. Toxicological information. It reflects the value after any corrections, e.g. route-to-route extrapolation. See column "Justification" for the rationale behind such modifications and the use of assessment factors.

8.2 Exposure controls

8.2.1 Appropriate engineering controls
SDS ECA 100
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

Hand protection
Glove material: Nitrile rubber
Glove material: Neoprene gloves
Glove material: PVC

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection
Safety glasses with side-shields

Skin and body protection
Protective clothing. Safety shoes

Respiratory protection
In case of inadequate ventilation for solid THPA, utilize approved respiratory protection for dust. For molten THPA, utilize approved respiratory protection for organic vapor and dust.

9. PHYSICAL AND CHEMICAL PROPERTIES
9.1 Information on basic physical and chemical properties

General Information (appearance, odor)

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Clear to yellow liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Faint characteristic odor</td>
</tr>
</tbody>
</table>

Important health safety and environmental information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point:</td>
<td>541°F (283°C)</td>
</tr>
<tr>
<td>Melting Point:</td>
<td>Not Established</td>
</tr>
<tr>
<td>Molecular Weight:</td>
<td>Varies</td>
</tr>
<tr>
<td>Volatility/Vol (%):</td>
<td>Not Established</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg):</td>
<td>0.002 at 77°F (25°C) (calculated)</td>
</tr>
<tr>
<td>Vapor Density (Air = 1):</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Solubility in H₂O:</td>
<td>Reacts slowly with water</td>
</tr>
<tr>
<td>Appearance/Odor:</td>
<td>Clear to yellow liquid / Faint characteristic odor</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not Established</td>
</tr>
<tr>
<td>Viscosity (cps):</td>
<td>Not Established</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1):</td>
<td>1.205 +/- 0.015 at 77°F (25°C)</td>
</tr>
</tbody>
</table>
Evap. Rate (Butyl Acetate = 1): <1
Flash Point: 320°F (160°C) PMCC, ASTM D93
Lower Explosive Limit: Not Established
Upper Explosive Limit: Not Established
Auto-ignition Temperature: Not Established

9.2 Other data
None

10. STABILITY AND REACTIVITY
10.1 Reactivity
Stable

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions : None known.

10.4 Conditions to avoid
Conditions to avoid : Incompatibles and excessive temperatures.

10.5 Incompatible materials
Materials to avoid : Alcohols, acids, bases, and oxidizers. Heat and / or water will affect product quality.

10.6 Hazardous decomposition products
Thermal decomposition : Note: no data available

11. TOXICOLOGICAL INFORMATION
11.1 Information on toxicological effects
Acute toxicity:

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Dose descriptor</th>
<th>Qualitative assessment</th>
<th>Remarks on study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>oral</td>
<td>LD50: 5410</td>
<td>Acute toxicity:</td>
</tr>
<tr>
<td>Endpoint</td>
<td>Dose descriptor</td>
<td>Qualitative assessment</td>
<td>Remarks on study</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Acute toxicity</td>
<td>oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>dermal</td>
<td>LD50: 2000 mg/kg bw</td>
<td>Oral - LD50 - ca. 3200 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dermal - LD50 - &gt; 2000 mg/kg</td>
</tr>
<tr>
<td>Irritation / Corrosivity</td>
<td>dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>skin</td>
<td>not irritating</td>
<td>Skin irritation: Not irritant</td>
</tr>
<tr>
<td></td>
<td>eye</td>
<td>highly irritating</td>
<td>Eye irritation: Corrosive</td>
</tr>
<tr>
<td>Irritation / Corrosivity</td>
<td>respiratory tract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitization</td>
<td>skin</td>
<td>sensitizing</td>
<td>Skin sensitization: sensitizing</td>
</tr>
<tr>
<td>Sensitization</td>
<td>respiratory tract</td>
<td>sensitizing</td>
<td>Respiratory sensitization: sensitizing</td>
</tr>
<tr>
<td>Repeated dose toxicity: sub-acute / sub-</td>
<td>oral</td>
<td>NOAEL: 100 mg/kg bw/day</td>
<td>Negative findings in bacterial reverse mutation test, chromosome aberration test and gene mutation test in mammalian cells.</td>
</tr>
<tr>
<td>chronic / chronic</td>
<td></td>
<td>(subacute; rat)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Target organs: digestive: stomach</td>
<td></td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>in vitro / in vivo</td>
<td></td>
<td>Genetic toxicity: negative</td>
</tr>
<tr>
<td>Reproductive toxicity: fertility</td>
<td>oral</td>
<td>NOAEL: 250 mg/kg bw/day</td>
<td>In a screening study for reproduction/developmental toxicity study with rats, the NOAEL is considered to be 250 mg/kg/day for reproductive performance of parents and for development of offspring.</td>
</tr>
<tr>
<td>impairment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity: fertility</td>
<td>dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>impairment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endpoint</td>
<td>Dose descriptor</td>
<td>Qualitative assessment</td>
<td>Remarks on study</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reproductive toxicity: developmental toxicity</td>
<td>oral</td>
<td>NOAEL: 250 mg/kg bw/day</td>
<td>In a screening study for reproduction/developmental toxicity study with rats, the NOAEL is considered to be 250 mg/kg/day for reproductive performance of parents and for development of offspring.</td>
</tr>
<tr>
<td>Reproductive toxicity: developmental toxicity</td>
<td>dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity: developmental toxicity</td>
<td>inhalation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hazardous if inhaled: NOT AVAILABLE**

### 12. ECOLOGICAL INFORMATION

#### 12.1 Ecotoxicity effects

**Short-term toxicity to fish:**

Acute toxicity to fish (Rainbow trout) was determined according to OECD/EU test methods. A limit test was conducted under static conditions with a single concentration of 100 mg/L with and without adjustment of pH. The LC50 was in excess of 100 mg/L; the LOEC was 100 mg/L based on behavioural effects seen without adjustment of pH.

The following information is taken into account for acute fish toxicity for the derivation of PNEC:

Acute toxicity to fish: LC50 - > 100 mg/L; LOEC 100 mg/L

**Value used for CSA:**

LC50 for freshwater fish: 100 mg/L

**Short-term toxicity aquatic invertebrates**

Acute immobilization to Daphnia magna has been investigated according to OECD/EU test methods. The effects of a limit concentration of 100 mg/L were determined, with and without adjustment of pH. The LC50 was in excess of 100 mg/L and the NOEC was 100 mg/L.

The following information is taken into account for short-term toxicity to aquatic invertebrates for the derivation of PNEC:

Acute daphnia immobilisation: LC50 > 100 mg/L; NOEC 100 mg/L.

**Value used for CSA:**

EC50/LC50 for freshwater invertebrates: 100 mg/L
Toxicity to aquatic algae and cyanobacteria:

**Effects on algae / cyanobacteria**

Algal growth inhibition the unicellular freshwater green alga *Pseudokirchneriella subcapitata* has been investigated according to OECD/EU test methods. THPA was found to inhibit the growth after 72 hours exposure, EC50 values for inhibition of specific growth rate (ErC50) and yield (EyC50) being 65.3 mg/L and 61.4 mg/L, respectively. The potential for recovery from the observed effects was established.

In accordance with ECHA guidance on information requirements and chemical safety assessment, Chapter R.7b: Endpoint specific guidance, the ErC50 endpoint is used in DNEL derivation. This is because use of values based on biomass cannot be applied to an analysis of results from a system in exponential growth without logarithmic transformation.

The following information is taken into account for effects on algae / cyanobacteria for the derivation of PNEC:

Algal growth inhibition: ErC50 = 65.3 mg/L; EyC50 = 61.4 mg/L; NOEC = 25 mg/L

**Value used for CSA:**

EC50/LC50 for freshwater algae: 65.3 mg/L

EC10/LC10 or NOEC for freshwater algae: 25 mg/L

EC50 (72 h): 65.3 mg/L test mat. (nominal) based on: growth rate

EC50 (72 h): 61.4 mg/L test mat. (nominal) based on: biomass

NOEC (72 h): 50 mg/L test mat. (nominal) based on: growth rate

NOEC (72 h): 12.5 mg/L test mat. (nominal) based on: biomass

LOEC (72 h): 100 mg/L test mat. (nominal) based on: growth rate

LOEC (72 h): 25 mg/L test mat. (nominal) based on: biomass

EC10 (72 h): 52.5 mg/L test mat. (nominal) based on: growth rate

EC10 (72 h): 24.8 mg/L test mat. (nominal) based on: biomass

EC20 (72 h): 56.9 mg/L test mat. (nominal) based on: growth rate

EC20 (72 h): 36.6 mg/L test mat. (nominal) based on: biomass

**Long-term toxicity to aquatic invertebrates:** NOT AVAILABLE

**Long-term toxicity to fish:** NOT AVAILABLE

**Toxicity to microorganisms:**

In accordance with REACh Regulation 1907/2006, Annex IX and X, Column 2, tests of short- and long-term toxicity do not need to be conducted as direct and indirect exposure of the soil compartment is unlikely. The substance has little potential to adsorb to soil and is not persistent. According to the available information about production and processing of the substance, and the uses identified, direct
releases of the substance to the terrestrial compartment can be excluded. EUSES modeling indicates that indirect releases, if occurring during use, are not a concern for the soil compartment.

**12.2 Persistence and degradability**

**Biodegradation:**

In accordance with REACH Regulation 1907/2006, Annex IX, Column 2, simulation tests of biodegradation in soil do not need to be conducted as the substance can be regarded as readily biodegradable.

A value has been calculated using a Fugacity model according to Mackay, Level III using EPIWIN (v.4.0)

The following information is taken into account for any hazard / risk / persistency assessment:

Half life in soil: 720 hours

**Value used for CSA:** Half-life in soil: 720 h

**Abiotic degradation**

It is predicted that the substance will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. The half-life for this reaction in air is estimated to be approximately 6.4 hours.

The substance is highly unstable at pH 4, 7 and 9 and 20, 30 and 50°C, respectively, hydrolysing to the diacid. Instability increased as temperature and pH increased. The half life is in the order of minutes.

**Biotic degradation**

Ready biodegradability has been investigated in a DOC-die away test according to EU test methods. Tetrahydrophthalic anhydride was found to be readily biodegradable but failed to meet the 10-day window criterion for the test.

Level III fugacity modeling indicates degradation in water, sediment and soil with half lifes estimated as 360, 3240 and 720 hours respectively

readily biodegradable

**Persistence:**

The substance is hydrolytically unstable, hydrolysing to the corresponding dicarboxylic acid with a half-life of minutes.

The substance is readily biodegradable, although failing the 10-day window criterion. It is reasonable to assume, as testing was undertaken in aqueous media, that the degradation product of the substance is degradable.

These data indicate that the substance is not persistent (P).

**12.3 Bioaccumulative potential**
Bioaccumulation

BCF has been calculated using the computer program BCFBAF (v3.00). It is predicted that the substance has BCF of 3.297 L/kg wet weight.

This is in agreement with the experimentally determined BCF of 4-cyclohexene-1,2-dicarboxylic acid (CAS No. 88-98-2), the degradation product of the submission substance, determined according to OECD test methods, which was as follows: < 0.2 at a test concentration of 2 mg/L and < 2 at a test concentration of 0.2 mg/L.

This data indicate that the substance is not bioaccumulative (B).

12.4 Mobility in soil
Adsorption/desorption:

The adsorption coefficient (Koc) on soil and on sewage sludge using high performance liquid chromatography (HPLC) was estimated according to OECD test methods. Log Koc soil was estimated to be 1.70 and log Koc sewage sludge was estimated to be 1.72. For the degradation product formed by hydrolysis Log Koc soil was estimated to be -1.34 and log Koc sewage sludge was estimated to be -1.57. The substance and its degradation product are both regarded as being highly mobile in soil.

The Henry's Law constant of 1.92 Pa·m³/mole indicates that the substance may not be significantly volatile from surface water.

Distribution in environmental compartments has been calculated using a Fugacity model according to Mackay, Level III. Distribution in various environmental compartments is estimated as: Air - 0.0363%; Water - 32.8%; Soil - 67.1% and Sediment - 0.0738%.

Refining modeling to examine distribution following emissions to waste water results in the following distribution: Air - 0.0319%; Water - 99.6%; Soil - 0.284% and Sediment - 0.0482%

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS
13.1 Waste treatment methods

Product In accordance with local and national regulations. The product should not be allowed to enter drains, water courses or the soil.

14. TRANSPORT INFORMATION
14.1 UN number
Land transport  Not classified as dangerous in the meaning of transport regulations.

Sea transport  Not classified as dangerous in the meaning of transport regulations.

Air transport  Not classified as dangerous in the meaning of transport regulations.

14.2 Special precautions for user
None

15. REGULATORY INFORMATION
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Regulations:

TSCA: All substances are listed on, or are exempt from reporting.

SARA Hazard Notification:

<table>
<thead>
<tr>
<th>Hazard Categories Under Title III:</th>
<th>Acute, Chronic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 302 Extremely Hazardous Substances:</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Section 313 Toxic Chemicals:</td>
<td>Not Listed</td>
</tr>
<tr>
<td>CERCLA RQ:</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

TSCA 12(b) Export Notification: Not Listed
California Proposition 65: Not Listed

WGK Classification: Class 2

WHMIS -D2A: Toxic Material Causing Other Toxic Effects

Australian Regulations:
All components are NOT listed on the AICS

Korean Regulations:
All components are NOT listed on the ECL

Japanese Regulations:
All components are NOT listed on the ENCS

Canadian Regulations:
All substances are listed on the DSL, or are exempt from reporting

European Regulations:
All components are listed on the EINECS

Philippine Regulations:
All components are NOT listed on the PICCS

New Zealand Regulations:

All components are NOT listed on the NZIoC

15.2 Chemical Safety Assessment
Available for MTHPA and THPA

16. OTHER INFORMATION
Date Revised: 03/04/2014

HMIS Hazard Rating
Health: 2
Fire: 1
Reactivity: 1

PPE rating to be supplied by user depending on use conditions.

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Least

distributed by:

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