SAFETY DATA SHEET

ARALDITE® LY 8604 US

SECTION 1. IDENTIFICATION

Product name : ARALDITE® LY 8604 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 constituents

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitization : Category 1
Acute aquatic toxicity : Category 2
Chronic aquatic toxicity : Category 2

GHS Label element
Hazard pictograms :

Signal Word : Warning

Hazard Statements :
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
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.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear eye protection/ face protection.
P280 Wear protective gloves.

**Response:**
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.

**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 ingredients**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BISPHENOL A EPOXY RESIN</td>
<td>25068-38-6</td>
<td>60 - 100</td>
</tr>
<tr>
<td>Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.</td>
<td>68609-97-2</td>
<td>13 - 30</td>
</tr>
<tr>
<td>p-tert-butylphenyl 1-(2,3-epoxy)propyl ether</td>
<td>3101-60-8</td>
<td>3 - 7</td>
</tr>
</tbody>
</table>

### SECTION 4. FIRST AID MEASURES

**General advice**
Consult a physician.
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.
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 hazards during fire fighting : Do not use a solid water stream as it may scatter and spread fire. Cool closed containers exposed to fire with water spray.
Hazardous combustion products : 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.

In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions : Local authorities should be advised if significant spillages cannot be contained.
No special environmental precautions required.
Methods and materials for containment and cleaning up : Keep in suitable, closed containers for disposal. Clean contaminated floors and objects thoroughly while observing environmental regulations.
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 : Normal measures for preventive fire protection.
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fire and explosion
Advice on safe handling : For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.
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
Contains no substances with occupational exposure limit values.

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
Ensure that eyewash stations and safety showers are close to the workstation location.
Safety glasses

Skin and body protection : Protective suit

Protective measures : Wear suitable protective equipment. When using do not eat, drink or smoke.

Hygiene measures : Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. General industrial hygiene practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid
Color : clear
Odor : slight
Odor Threshold : No data is available on the product itself.
pH : No data is available on the product itself.

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Flash point: > 93.33 °C
   Method: estimated, closed cup

Evaporation rate: < 1

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: < 1.333 hPa (20 °C)

Relative vapor density: No data is available on the product itself.

Relative density: 1.15

Density: 1.1 g/cm³

Solubility(ies)
   Water solubility: negligible
   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.

Autoignition temperature: No data is available on the product itself.

Thermal decomposition: No data is available on the product itself.

Viscosity
   Viscosity, dynamic: 750 mPa.s (20 °C)

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: Stable under normal conditions.
   No decomposition if stored and applied as directed.

Possibility of hazardous reactions: Stable under normal conditions.
   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.
exposure

Acute toxicity

**Ingredients:**
BISPHENOL A EPOXY RESIN:
Acute oral toxicity
Ingredients: LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Acute oral toxicity
Ingredients: LD50 (Rat, male): ca. 30.1 ml/kg

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Acute oral toxicity
Ingredients: LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 425

**Ingredients:**
BISPHENOL A EPOXY RESIN:
Acute inhalation toxicity
Ingredients: LC0 (Rat, male): 10 ppt
Exposure time: 5 h
Test atmosphere: vapor

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Acute inhalation toxicity
Ingredients: LC0 (Rat): > 0.15 mg/l
Exposure time: 7 h
Test atmosphere: vapor

**Ingredients:**
BISPHENOL A EPOXY RESIN:
Acute dermal toxicity
Ingredients: LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Acute dermal toxicity
Ingredients: LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402

Acute toxicity (other routes of administration):
Ingredients: 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:**
**BISPHENOL A 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

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

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:**
**BISPHENOL A 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
Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:  
Genotoxicity in vivo  :  Cell type: Somatic  
Application Route: Intraperitoneal injection  
Method: OECD Test Guideline 474  
Result: negative

**Ingredients:**  
**BISPHENOL A EPOXY RESIN:**  
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:**  
**BISPHENOL A 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

Carcinogenicity-Assessment  :  No data available  

**IARC**  
No ingredient 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 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

No ingredient 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

Ingredients:
BISPHENOL A 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.

Ingredients:
BISPHENOL A 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.

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Species: Rat, female
Application Route: Dermal
General Toxicity Maternal: No-observed-effect level: 200 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:**

BISPHENOL A 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

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Species: Rat, male and female
No-observed-effect level: 1 mg/kg/d
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic 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
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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:
BISPHENOL A EPOXY RESIN:
Toxicity to fish: LC50 (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

Oxirane, 2-[(C12-14-alkyloxy)methyl] deriv.:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 5,000 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: LC50: 7.5 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Ingredients:
BISPHENOL A EPOXY RESIN:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 2.7 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
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Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Toxicity to daphnia and other aquatic invertebrates: EL50 (Daphnia magna (Water flea)): 7.2 mg/l
Exposure time: 48 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:

BISPHENOL A 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

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Toxicity to algae: IC50 (Selenastrum capricornutum (green algae)): 843.75 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

Toxicity to fish (Chronic toxicity): No data available

Ingredients:

BISPHENOL A EPOXY RESIN:
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
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**Ingredients:**

**BISPHENOL A EPOXY RESIN:**
- Toxicity to bacteria: IC50 (activated sludge): > 100 mg/l
  - Exposure time: 3 h
  - Test Type: static test
  - Test substance: Fresh water

**Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:**
- Toxicity to bacteria: IC50: > 100 mg/l
  - Exposure time: 3 h
  - 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:**

**BISPHENOL A 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

**Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:**
- Biodegradability: Inoculum: Domestic sewage
  - Concentration: 100 mg/l
Result: Readily biodegradable.
Biodegradation: 87 %
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:
BISPHENOL A EPOXY RESIN:
Bioaccumulation
Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Ingredients:
BISPHENOL A EPOXY RESIN:
Partition coefficient: n-octanol/water
log Pow: 3.242 (25 °C)
Method: OECD Test Guideline 117

Oxirane, 2-[(C12-14-alkyloxy)methyl] derivs.:
Partition coefficient: n-octanol/water
log Pow: 3.77 (20 °C)
Method: OECD Test Guideline 107
p-tert-butylphenyl 1-(2,3-epoxy)propyl ether:
Partition coefficient: n-octanol/water : log Pow: 3.59 (20 °C)
                           : pH: 7
                           : Method: OECD Test Guideline 107

Mobility in soil
Mobility : No data available

Ingredients:
BISPHENOL A EPOXY RESIN:
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 : 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
Global warming potential (GWP) : There is no data available for this product.
                          : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues : Dispose of wastes in an approved waste disposal facility.
                      : 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)
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)
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)
Class: 9
Packing group: III
Labels: CLASS 9
ERG Code: 171
Marine pollutant: yes (BISPHENOL A EPOXY RESIN)

SECTION 15. REGULATORY INFORMATION

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TSCA - 5(a) Significant New Use Rule List of Chemicals

Clean Air Act
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).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC’s (40 CFR 60.489).

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:

CH INV  :  The mixture contains substances listed on the Swiss Inventory
TSCA  :  On TSCA Inventory
DSL  :  This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian DSL.
AICS  :  On the inventory, or in compliance with the inventory
NZIoC  :  On the inventory, or in compliance with the inventory
ENCS  :  Not in compliance with the inventory
ISHL  :  Not in compliance with the inventory
KECI  :  Not in compliance with the inventory
PICCS  :  On the inventory, or in compliance with the inventory
IECS  :  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), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

NFPA:

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Special hazard.</th>
</tr>
</thead>
<tbody>
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<td>0</td>
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HMIS III:

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

0 = not significant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme, * = Chronic
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Revision Date : 10/06/2015

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SAFETY DATA SHEET

ARADUR® 8604 US

Version 1.0    Revision Date: 11/17/2016    SDS Number: 400001012854    Date of last issue: -

SECTION 1. IDENTIFICATION

Product name : ARADUR® 8604 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 (USA)
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 in accordance with 29 CFR 1910.1200
Skin corrosion : Category 1B
Serious eye damage : Category 1
Respiratory sensitisation : Category 1
Skin sensitisation : Category 1
Reproductive toxicity : Category 2
Acute aquatic toxicity : Category 3

GHS label elements
Hazard pictograms : 

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.
                    H317 May cause an allergic skin reaction.
                    H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
                    H361 Suspected of damaging fertility or the unborn child.
                    H402 Harmful to aquatic life.
Precautionary statements:

**Prevention:**
P201 Obtain special instructions before use. 
P202 Do not handle until all safety precautions have been read and understood. 
P261 Avoid breathing dust/ dust/ 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. 
P285 In case of inadequate ventilation wear respiratory 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. 
P308 + P313 IF exposed or concerned: Get medical advice/attention. 
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>3-[[3-(dimethylamino)propyl]amino]propiononitrile</td>
<td>69852-45-5</td>
<td>60 - 100</td>
</tr>
<tr>
<td>N&quot;-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine</td>
<td>10563-29-3</td>
<td>13 - 30</td>
</tr>
<tr>
<td>Triethanolamine</td>
<td>102-71-6</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Piperazine</td>
<td>110-85-0</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Aminoethylpiperazine</td>
<td>140-31-8</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 : Call a physician or poison control centre immediately.
If unconscious, place in recovery position and seek medical advice.

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.

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 : No data is available on the product itself.
Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion : No hazardous combustion products are known
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.

Special protective equipment for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment.
Ensure adequate ventilation.

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

Avoid formation of aerosol.
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.
Provide sufficient air exchange and/or exhaust in work rooms.
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

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triethanolamime</td>
<td>102-71-6</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>ACGIH</td>
</tr>
<tr>
<td>piperazine</td>
<td>110-85-0</td>
<td>TWA (Inhalable fraction and vapor)</td>
<td>0.03 ppm (as piperazine)</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Personal protective equipment

Respiratory protection: In the case of vapour formation use a respirator with an approved filter.

Hand protection
Remarks: 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: clear
amber

Odour: amine-like

Odour Threshold: No data is available on the product itself.
PH: No data is available on the product itself.
Freezing point: No data is available on the product itself.
Melting point: No data is available on the product itself.
Boiling point: No data is available on the product itself.
Flash point: > 93 °C
   Method: estimated, closed cup
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: 0.9
Density: No data is available on the product itself.
Solubility: partly soluble
Water solubility: partly soluble
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.
Explosive properties: No data is available on the product itself.
Oxidizing properties: No data is available on the product itself.
Particle size: No data is available on the product itself.
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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: > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity: No data available

Acute dermal toxicity - Product: Acute toxicity estimate: 4,523 mg/kg
Method: Calculation method

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

Skin corrosion/irritation

Product: Remarks: Extremely corrosive and destructive to tissue.

Serious eye damage/eye irritation

Product: Remarks: May cause irreversible eye damage.

Respiratory or skin sensitisation

Product: Remarks: Causes sensitisation.

Assessment: No data available

Germ cell mutagenicity

Components:
N’-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

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

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

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

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Concentration: 0 - 1500 μg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

piperazine:
Genotoxicity in vitro

Concentration: 0 - 10000 μg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Concentration: 0 - 110 μg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Concentration: 0 - 500 μg/L
Metabolic activation: Metabolic activation
Method: OECD Test Guideline 476
Result: positive

Concentration: 0 - 500 μg/L
Metabolic activation: negative
Method: OECD Test Guideline 476
Result: negative

Aminopropylpiperazine:
Genotoxicity in vitro

Concentration: 5000 μg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

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

Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Components:
piperazine:
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Genotoxicity in vivo

: Dose: 5000 mg/kg
Result: negative

Aminoethylpiperazine:
Genotoxicity in vivo

: Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Components:
N’-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Species: Mouse, (male)
Application Route: Dermal
Exposure time: 20 month(s)
Frequency of Treatment: 3 daily
Result: negative

Triethanolamine:
Species: Rat, (male and female)
Application Route: Dermal
Exposure time: 103 weeks
Dose: 250 mg/kg
Frequency of Treatment: 5 daily
Method: OECD Test Guideline 451
Result: negative

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.

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

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:
N’-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Effects on fertility

: Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.
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Triethanolamine:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

piperazine:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416

Aminoethylpiperazine:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: No effects on fertility and early embryonic development were detected.

Components:
N,N'-[3-aminopropyl]-N,N-dimethylpropane-1,3-diamine:
Effects on foetal development:
Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 15 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 15 mg/kg body weight
Embryo–foetal toxicity: No observed adverse effect level: 15 mg/kg body weight
Method: OECD Test Guideline 422
Result: No effects on fertility and early embryonic development were detected.

Triethanolamine:
Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: > 1,000 mg/kg body weight
Method: OECD Test Guideline 421
Result: No teratogenic effects

Species: Rat
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 75 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 10 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects
piperazine:
Species: Rat, female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level: 420 mg/kg body weight  
Result: No teratogenic effects

Aminoethylpiperazine:
Test Type: Embryo-foetal development  
Species: Rat, female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level: 420 mg/kg body weight  
Embryo-foetal toxicity: No observed adverse effect level: 1,000 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Test Type: Fertility/early embryonic development  
Species: Rabbit, female  
Application Route: Oral  
General Toxicity Maternal: No observed adverse effect level: 75 mg/kg body weight  
Embryo-foetal toxicity: No observed adverse effect level: 75 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: Teratogenicity and developmental toxicity

Components:
N^2-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Reproductive toxicity - Assessment: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

piperazine:
Reproductive toxicity - Assessment: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Aminoethylpiperazine:
Reproductive toxicity - Assessment: Some evidence of adverse effects on development, based on animal experiments.

STOT - single exposure
No data available

STOT - repeated exposure
Components:
Aminoethylpiperazine:
Exposure routes: Inhalation  
Target Organs: Respiratory Tract  
Assessment: Causes damage to organs through prolonged or repeated exposure.
Repeated dose toxicity

Components:
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Species: Rat, male and female
  : 550 ppm
Application Route: Ingestion
Test atmosphere: vapour
Exposure time: 3 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Mouse, male
NOAEL: > 56.3 mg/kg/d
Application Route: Skin contact
Exposure time: 20 h
Number of exposures: 3 d
Method: Chronic toxicity

Triethanolamine:
Species: Rat, male and female
  : 1000 mg/kg, 500 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 672 h
Method: OECD Test Guideline 412

Species: Rat, male and female
  : 125 - 500 mg/kg, 420 mg/m3
Application Route: Skin contact
Test atmosphere: dust/mist
Exposure time: 2,160 h
Number of exposures: 6 h
Method: Subchronic toxicity

 Piperazine:
Species: Rat, male and female
NOAEL: 627 mg/kg/d
Application Route: Ingestion
Exposure time: 2,160 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Humans
LOAEL: 30 mg/kg/d
Application Route: Ingestion
Exposure time: 168 h
Method: Subacute toxicity

Aminoethylpiperezine:
Species: Rat, male and female
NOAEL: 152 mg/kg/d
Application Route: Oral
Exposure time: 28 d  
Method: OECD Test Guideline 422

Species: Rat, male and female  
NOAEL: > 1000 mg/kg/d  
Application Route: Skin contact  
Exposure time: 29 d  
Number of exposures: 6h/application, 5d/week  
Method: OECD Test Guideline 410

Species: Rat, male and female  
: 0.2 mg/m3  
Application Route: Inhalation  
Exposure time: 90 d  
Number of exposures: 6h/d, 5d/week  
Method: OECD Test Guideline 413

Target Organs: Respiratory Tract  
Assessment: The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Species: Rat, male and female  
: 53.3 mg/m3  
Application Route: Inhalation  
Exposure time: 90 d  
Number of exposures: 6h/d, 5d/week  
Method: OECD Test Guideline 413

Repeated dose toxicity - Assessment: No data available

**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
SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

N\(^\text{3}\)-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): > 100 mg/l
   Exposure time: 96 h
   Test Type: static test
   Test substance: Fresh water
   Method: OECD Test Guideline 203

Triethanolamine:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 11,803 mg/l
   Exposure time: 96 h
   Test Type: flow-through test
   Test substance: Fresh water

Piperazine:
Toxicity to fish: LC50 (Poecilia reticulata (guppy)): > 1,800 mg/l
   Exposure time: 96 h
   Test Type: semi-static test
   Test substance: Fresh water

Aminoethylpiperazine:
Toxicity to fish: LC50: 2,190 mg/l
   Exposure time: 96 h
   Test Type: static test
   Test substance: Fresh water

Components:

N\(^\text{3}\)-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 9.2 mg/l
   Exposure time: 48 h
   Test Type: static test
   Test substance: Fresh water
   Method: OECD Test Guideline 202

Triethanolamine:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Ceriodaphnia dubia (Water flea)): 609.88 mg/l
   Exposure time: 48 h
   Test Type: static test
   Test substance: Fresh water

Piperazine:
Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 21 mg/l
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aquatic invertebrates
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

Aminoethylpiperazine:
Toxicity to daphnia and other aquatic invertebrates
Toxicity to algae: EC50 (Daphnia magna (Water flea)): 58 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Components:
N’-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): 21 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Triethanolamine:
Toxicity to algae: ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 512 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38412

piperazine:
Toxicity to algae: NOECr (Selenastrum capricornutum (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Aminoethylpiperazine:
Toxicity to algae: EC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

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

Toxicity to fish (Chronic toxicity):
No data available

Components:
Triethanolamine:
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
NOEC (Daphnia magna (Water flea)): 16 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

- NOEC (Daphnia magna (Water flea)): 12.5 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

Components:

3-[3-(dimethylamino)propyl]amino]propiononitrile:

- NOEC (activated sludge): 1,000 mg/l
- Exposure time: 3 h
- Test Type: Respiration inhibition
- Method: OECD Test Guideline 209

- EC50 (activated sludge): 6.6 mg/l
- Exposure time: 3 h
- Test Type: Respiration inhibition
- Method: OECD Test Guideline 209

N-((3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

- EC50 (Pseudomonas putida): 181 mg/l
- Exposure time: 16 h
- Test Type: static test
- Test substance: Fresh water
- Method: DIN 38 412 Part 8

Triethanolamine:

- EC50 (activated sludge): > 1,000 mg/l
- Exposure time: 3 h
- Test Type: static test
- Test substance: Fresh water
- Method: OECD Test Guideline 209

Components:

Aminoethylpiperazine:

- LC50 (Eisenia fetida (earthworms)): 712 mg/kg
- Exposure time: 56 d
- Method: OECD Test Guideline 222

- NOEC (Eisenia fetida (earthworms)): 500 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
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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:
N\(^{-1}\)(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:
Biodegradability: Result: Readily biodegradable.
Biodegradation: 100 %
Exposure time: 28 d
Method: ISO Method, other

Triethanolamine:
Biodegradability: Inoculum: activated sludge
Concentration: 5.7 mg/l
Result: Readily biodegradable.
Biodegradation: ca. 100 %
Exposure time: 5 d
Method: OECD Test Guideline 301F

piperazine:
Biodegradability: Inoculum: activated sludge
Result: Readily biodegradable.
Biodegradation: 70.2 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

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

Components:
Aminoethylpiperazine:
Biochemical Oxygen Demand (BOD): 5 mg/l
Incubation time: 5 d

Components:
Triethanolamine:
Chemical Oxygen Demand (COD): 1600 mgO\(_2\)/g
Aminoethylpiperazine:
Chemical Oxygen Demand: 560 mg/l
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(COD)
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

Components:
piperazine:
Photodegradation : Test Type: Air
Rate constant: < .00001
Degradation (direct photolysis): 50 %

Aminoethylpiperazine:
Photodegradation : Test Type: Air
Degradation (direct photolysis): 50 %

Impact on Sewage Treatment : No data available

Bioaccumulative potential
Components:
Triethanolamine:
Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): < 3.9
Exposure time: 42 d
Test substance: Fresh water
Method: flow-through test

Aminoethylpiperazine:
Bioaccumulation : Species: Fish
Remarks: Does not bioaccumulate.

Components:
N\(^{+}\)-(3-aminopropyl)-N,N-dimethylpropene-1,3-diamine:
Partition coefficient: n-octanol/water : log Pow: 0.5
log Pow: -0.56 (25 °C)
pH: 11.6
Method: OECD Test Guideline 107

Triethanolamine:
Partition coefficient: n-octanol/water
  : log Pow: -2.3 (25 °C)
    pH: 7.1

Partition coefficient: n-octanol/water
  : log Pow: -1.17

Aminoethylpiperazine:
Partition coefficient: n-octanol/water
  : log Pow: -1.24 (25 °C)
  : log Pow: -1.48 (20 °C)

Mobility in soil
Mobility
  : No data available

Components:
Triethanolamine:
  : Koc: 18
Distribution among environmental compartments
piperazine:
  : Koc: 507
Method: OECD Test Guideline 106
Distribution among environmental compartments
Aminoethylpiperazine:
  : Koc: ca. 37000
Distribution among environmental compartments
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.
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<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
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</tr>
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<tbody>
<tr>
<td>1.0</td>
<td>11/17/2016</td>
<td>400001012854</td>
<td>-</td>
</tr>
</tbody>
</table>

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 Regulations**

**IATA**

<table>
<thead>
<tr>
<th>UN/ID No.</th>
<th>UN 2735</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper shipping name</td>
<td>Amines, liquid, corrosive, n.o.s. (DIMETHYL DIPROPYL TRIAMINE)</td>
</tr>
<tr>
<td>Class</td>
<td>8</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Labels</td>
<td>Corrosive</td>
</tr>
<tr>
<td>Packing instruction (cargo aircraft)</td>
<td>855</td>
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<tr>
<td>Packing instruction (passenger aircraft)</td>
<td>851</td>
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</table>

**IMDG**

<table>
<thead>
<tr>
<th>UN number</th>
<th>UN 2735</th>
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<tbody>
<tr>
<td>Proper shipping name</td>
<td>AMINES, LIQUID, CORROSIVE, N.O.S. (DIMETHYL DIPROPYL TRIAMINE)</td>
</tr>
<tr>
<td>Class</td>
<td>6</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Labels</td>
<td>8</td>
</tr>
<tr>
<td>EmS Code</td>
<td>F-A, S-B</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>no</td>
</tr>
</tbody>
</table>

*Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code*

Not applicable for product as supplied.

**National Regulations**
SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component RQ (lbs)</th>
<th>Calculated product RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2'-iminodiethanol</td>
<td>111-42-2</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 311/312 Hazards : Acute Health Hazard
                        Chronic 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 : WARNING! This product contains a chemical known to the State of California to cause cancer.

2,2'-iminodiethanol 111-42-2

The components of this product are reported in the following inventories:

CH INV : The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory

TSCA : On the inventory, or in compliance with the inventory

DSL : This product contains one or several components listed in the Canadian NDSL.

AICS : Not in compliance with the inventory

N2IoC : Not in compliance with the inventory

ENCS : Low volume exemption, On the inventory, or in compliance with the inventory

KECI : Not in compliance with the inventory

PICCS : Not in compliance with the inventory

IECSC : Not in compliance with the inventory

TCIS : Not 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)
Exemptions from the obligation to register

SECTION 16. OTHER INFORMATION

Further information

NFPA:

HMIS® IV:

HEALTH ★ 3
FLAMMABILITY 1
PHYSICAL HAZARD 0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks.

Revision Date : 11/17/2016

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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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