

# SAFETY DATA SHEET

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## ARALDITE® LY 8604 US

|         |                |              |                                 |
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| Version | Revision Date: | SDS Number:  | Date of last issue:             |
| 1.1     | 02/20/2019     | 400001012463 | 10/06/2015                      |
|         |                |              | Date of first issue: 10/06/2015 |

### 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 (USA)  
Telephone : Non-Emergency: (800) 257-5547  
E-mail address of person responsible for the SDS : SDS@huntsman.com  
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

#### Recommended use of the chemical and restrictions on use

Recommended use : Epoxy constituents  
Restrictions on use : For industrial use only.



### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with 29 CFR 1910.1200

Skin irritation : Category 2  
Eye irritation : Category 2A  
Skin sensitisation : Category 1  
Short-term (acute) aquatic hazard : Category 2  
Long-term (chronic) aquatic hazard : Category 2

#### GHS label elements

Hazard pictograms :  

Signal word : Warning

Hazard statements : H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.

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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 protective gloves/ eye protection/ face protection.

**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.

**Storage:**

Not available

**Disposal:**

P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

**Other hazards**

None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Hazardous components**

| Chemical name   | CAS-No.    | Concentration (% w/w) |
|---|------------|-----------------------|
| 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane | 1675-54-3  | 70 - 90               |
| Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.                      | 68609-97-2 | 10 - 20               |
| p-tert-butylphenyl 1-(2,3-epoxy)propyl ether                        | 3101-60-8  | 5 - 10                |

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

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

## SECTION 4. FIRST AID MEASURES

## General advice

: Move out of dangerous area.  
Show this safety data sheet to the doctor in attendance.  
Treat symptomatically.

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Get medical attention if symptoms occur.

If inhaled : If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.

In case of skin contact : If skin irritation persists, call a physician.  
If on skin, rinse well with water.  
If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water.  
Remove contact lenses.  
Keep eye wide open while rinsing.  
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.  
Never give anything by mouth to an unconscious person.  
If symptoms persist, call a physician.

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

Notes to physician : Treat symptomatically.

### SECTION 5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media : High volume water jet

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

Hazardous combustion products : Carbon oxides  
Halogenated compounds

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, : Use personal protective equipment.

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|   |   |
|---|---|
| protective equipment and emergency procedures         | Refer to protective measures listed in sections 7 and 8.  |
| Environmental precautions                             | : Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>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).<br>Keep in suitable, closed containers for disposal.                             |

**SECTION 7. HANDLING AND STORAGE**

|   |  |
|---|--|
| Advice on protection against fire and explosion | : Normal measures for preventive fire protection.  |
| Advice on safe handling                         | : Do not breathe vapours/dust.<br>Avoid exposure - obtain special instructions before use.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>Dispose of rinse water in accordance with local and national regulations.<br>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.<br>Containers which are opened must be carefully resealed and kept upright to prevent leakage.<br>Keep in properly labelled containers.  |
| Materials to avoid                              | : For incompatible materials please refer to Section 10 of this SDS.   |
| Further information on storage stability        | : Stable under normal conditions.  |

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

**Personal protective equipment**

|                        |  |
|------------------------|--|
| Respiratory protection | : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any |
|------------------------|--|

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hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

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   |
| Odour  | : slight  |
| 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                                      | : > 199.99 °F / > 93.33 °C<br>Method: estimated, closed cup |
| Evaporation rate                                 | : < 1   |
| Flammability (solid, gas)                        | : No data is available on the product itself.               |
| Flammability (liquids)                           | : No data is available on the product itself.               |
| Upper explosion limit / Upper flammability limit | : No data is available on the product itself.               |
| Lower explosion limit / Lower                    | : No data is available on the product itself.               |



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flammability limit

Vapour pressure : < 1.333 hPa (68 °F / 20 °C)

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

Relative density : 1.15

Density : 1.1 g/cm<sup>3</sup>

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.

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

Viscosity, dynamic : 750 mPa.s (68 °F / 20 °C)

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.

## SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : No hazards to be specially mentioned.

Conditions to avoid : None known.

Incompatible materials : None known.

Hazardous decomposition products : carbon dioxide

carbon monoxide

Halogenated compounds

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## SECTION 11. TOXICOLOGICAL INFORMATION

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

**Acute toxicity****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Acute oral : LD50 (Rat, male): ca. 26.8 g/kg  
 toxicityComponents : Method: Other guidelines

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

Acute oral : LD50 (Rat, female): > 2,000 mg/kg  
 toxicityComponents : Method: OECD Test Guideline 425  
 Assessment: The substance or mixture has no acute oral toxicity

**Components:**

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Acute inhalation toxicity : LC0 (Rat): > 0.15 mg/l  
 Exposure time: 7 h  
 Test atmosphere: vapour  
 Method: Other guidelines

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Acute dermal toxicity : (Rabbit, male): > 4,000 mg/kg, 4,5 ml/kg  
 Assessment: The substance or mixture has no acute dermal toxicity

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

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

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## toxicity

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

**Skin corrosion/irritation****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species: Rabbit

Assessment: Mild skin irritant

Method: OECD Test Guideline 404

Result: Irritating to skin.

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species: Rabbit

Exposure time: 24 h

Method: Acute Dermal Toxicity

Result: Irritating to skin.

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

Species: Rat

Assessment: No skin irritation

Method: OECD Test Guideline 402

Result: No skin irritation

**Serious eye damage/eye irritation****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species: Rabbit

Result: Irritating to eyes.

Assessment: Mild eye irritant

Method: OECD Test Guideline 405

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species: Rabbit

Result: slight irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

**Respiratory or skin sensitisation****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Exposure routes: Skin

Species: Mouse

Assessment: May cause sensitisation by skin contact.



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Method: OECD Test Guideline 429  
Result: Causes sensitisation.

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Test Type: Buehler Test

Exposure routes: Skin

Species: Guinea pig

Method: OPPTS 870.2600

Result: May cause sensitisation by skin contact.

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

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: The product is a skin sensitizer, sub-category 1A.

Assessment: No data available

**Germ cell mutagenicity****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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, mono[(C12-14-alkyloxy)methyl] derivs.:

Genotoxicity in vitro : Test Type: Ames test  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: positive

Test Type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster ovary cells

Concentration: 0,5 - 5.000 µg/mL

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 : Test Type: Chromosome aberration test in vitro  
Test system: Chinese hamster ovary cells  
Concentration: 50 ug/plate  
Metabolic activation: negative  
Method: OECD Test Guideline 473  
Result: positive

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

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Method: OECD Test Guideline 471  
Result: positive

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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, mono[(C12-14-alkyloxy)methyl] derivs.:

Genotoxicity in vivo : Test Type: In vivo micronucleus test  
Species: Mouse (male and female)  
Cell type: Bone marrow  
Application Route: Intraperitoneal injection  
Exposure time: 24 hr, 48 hr, and 72 hr  
Method: OECD Test Guideline 474  
Result: negative

**Carcinogenicity****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

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**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 on OSHA's list of regulated carcinogens.

**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:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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.

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species: Rat, male and female  
 Application Route: Dermal  
 Duration of Single Treatment: 13 Weeks  
 Frequency of Treatment: 5 days/week  
 General Toxicity - Parent: No observed adverse effect level: 100 mg/kg body weight  
 Method: OECD Test Guideline 411

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Effects on foetal development

: Species: Rabbit, female  
 Application Route: Dermal  
 General Toxicity Maternal: 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: No observed adverse effect level: 60 mg/kg body weight

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Method: OECD Test Guideline 414  
Result: No teratogenic effects

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

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Species: Rat, female  
Application Route: Dermal  
Duration of Single Treatment: 6 h  
General Toxicity Maternal: No observed adverse effect level:  
200 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
200 mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

Reproductive toxicity - : No data available  
Assessment

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Repeated dose toxicity****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Species: Rat, male and female

NOAEL: 50 mg/kg

Application Route: Ingestion

Exposure time: 14 Weeks

Number of exposures: 7 d

Method: Subchronic toxicity

Species: Rat, male and female

NOEL: 10 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 5 d

Method: Subchronic toxicity

Species: Mouse, male

NOAEL: 100 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 3 d

Method: Subchronic toxicity

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Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:  
Species: Rat, male and female  
NOEL: 1 mg/kg  
LOAEL: 10 mg/kg  
Application Route: Skin contact  
Exposure time: 13 Weeks  
Number of exposures: 5 days/week for 13 weeks  
Method: OECD Test Guideline 411

Repeated dose toxicity - : No data available  
Assessment

### Aspiration toxicity

No data available

### Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

### Toxicology, Metabolism, Distribution

No data available

### Neurological effects

No data available

### Further information

Ingestion: No data available

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Components:

2,2'-[[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l



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Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Method: OECD Test Guideline 203

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

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

Oxirane, mono[(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  
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

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Toxicity to algae/aquatic plants : 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, mono[(C12-14-alkyloxy)methyl] derivs.:

Toxicity to algae/aquatic plants : IC50 (Selenastrum capricornutum (green algae)): 843.75 mg/l  
Exposure time: 72 h  
Test Type: static test  
Method: OECD Test Guideline 201

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

Toxicity to algae/aquatic plants : EbC50 (Selenastrum capricornutum (green algae)): ca. 9 mg/l  
Exposure time: 72 h

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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

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l  
Exposure time: 3 h  
Test Type: static test  
Method: OECD Test Guideline 209

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

Toxicity to microorganisms : 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

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Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

**Persistence and degradability****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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, mono[(C12-14-alkyloxy)methyl] derivs.:

Biodegradability : Test Type: aerobic  
Inoculum: activated sludge  
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 : Test Type: aerobic  
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

**Components:**

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2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Stability in water : Degradation half life(DT50): 4.83 d (77 °F / 25 °C) pH: 4  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life(DT50): 7.1 d (77 °F / 25 °C) pH: 9  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life(DT50): 3.58 d (77 °F / 25 °C) pH: 7  
Method: OECD Test Guideline 111  
Remarks: Fresh water

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

Stability in water : Degradation half life(DT50): ca. 17 d (77 °F / 25 °C) pH: 7  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life(DT50): ca. 7.98 d (77 °F / 25 °C) pH: 4  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Degradation half life(DT50): ca. 10.8 d (77 °F / 25 °C) pH: 9  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

**Bioaccumulative potential****Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Bioaccumulation : Bioconcentration factor (BCF): 31  
Remarks: Does not bioaccumulate.

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)  
pH: 7.1  
Method: OECD Test Guideline 117

Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.:

Partition coefficient: n-octanol/water : log Pow: 3.77 (68 °F / 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 (68 °F / 20 °C)  
pH: 7  
Method: OECD Test Guideline 107

**Mobility in soil**

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Mobility : No data available

### Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Distribution among : Koc: 445

environmental compartments

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

Distribution among : OECD Test Guideline 121

environmental compartments Koc: ca. 755, log Koc: ca. 2.88

Method: OECD Test Guideline 121

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.  
Toxic to aquatic life with long lasting effects.

Global warming potential (GWP) : No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

### **Disposal methods**

Waste from residues : The product should not be allowed to enter drains, water  
courses or the soil.  
Do not contaminate ponds, waterways or ditches with  
chemical or used container.  
Send to a licensed waste management company.  
Dispose of as hazardous waste in compliance with local and  
national regulations.



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

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

## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### 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.

### National Regulations

#### 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)

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**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

**SECTION 15. REGULATORY INFORMATION****EPCRA - Emergency Planning and Community Right-to-Know Act****CERCLA Reportable Quantity**

| Components                | CAS-No.  | Component RQ<br>(lbs) | Calculated product RQ<br>(lbs) |
|---------------------------|----------|-----------------------|--------------------------------|
| 1-chloro-2,3-epoxypropane | 106-89-8 | 100                   | *                              |

\*: Calculated RQ exceeds reasonably attainable upper limit.

**SARA 311/312 Hazards** : Skin corrosion or irritation  
Serious eye damage or eye irritation  
Respiratory or skin sensitisation

**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 can expose you to chemicals including 4,4'-isopropylidenediphenol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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

|        |   |
|--------|---|
| CH INV | : The formulation contains substances listed on the Swiss 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  |
| KECI   | : Not in compliance with the inventory  |
| PICCS  | : On the inventory, or in compliance with the inventory   |
| IECSC  | : On the inventory, or in compliance with the inventory   |
| TCSI   | : On the inventory, or in compliance with the inventory   |

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

### Inventories

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

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

No substances are subject to a Significant New Use Rule.

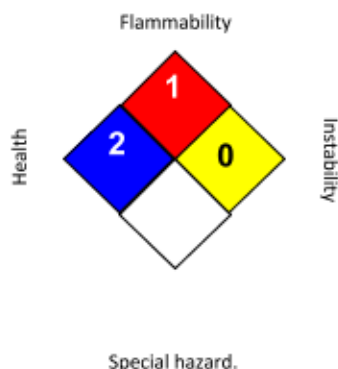
### US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

### Further information

#### NFPA 704:



#### HMIS® IV:

|                 |   |
|-----------------|---|
| HEALTH          | 2 |
| 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. The "" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Revision Date : 02/20/2019

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

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

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

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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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**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.



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

| Chemical name                                      | CAS-No.    | Concentration (% w/w) |
|--|------------|-----------------------|
| 3-[[3-(dimethylamino)propyl]amino]propiononitrile  | 69852-45-5 | 60 - 100              |
| N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine | 10563-29-8 | 13 - 30               |
| Triethanolamine                                    | 102-71-6   | 3 - 7                 |
| piperazine   | 110-85-0   | 1 - 3                 |
| Aminoethylpiperazine                               | 140-31-8   | 0.1 - 1               |

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

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**SECTION 4. FIRST AID MEASURES**

- |   |   |
|---|---|
| General advice  | : Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Do not leave the victim unattended.  |
| If inhaled  | : Call a physician or poison control centre immediately.<br>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.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes.  |
| In case of eye contact                                      | : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Protect unharmed eye.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed  | : Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Do not give milk or alcoholic beverages.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>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.<br><br>Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion                 | : No hazardous combustion products are known   |

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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.

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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**

| Components      | CAS-No.  | Value type<br>(Form of exposure)      | Control parameters /<br>Permissible concentration | Basis |
|-----------------|----------|---------------------------------------|---|-------|
| Triethanolamine | 102-71-6 | TWA                                   | 5 mg/m <sup>3</sup>                               | ACGIH |
| piperazine      | 110-85-0 | TWA<br>(Inhalable fraction and vapor) | 0.03 ppm<br>(as piperazine)                       | ACGIH |
|                 |          | TWA<br>(Inhalable fraction and vapor) | 0.03 ppm<br>(piperazine)                          | ACGIH |

**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.

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|----------------|------------------------------|-----------------------------|--|

|  |   |
|--|---|
| 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<br>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(ies)                                    |   |
| 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. |

## SECTION 10. STABILITY AND REACTIVITY



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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

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

Triethanolamine:  
Genotoxicity in vitro

: 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

Aminoethylpiperazine:  
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 - : No data available  
Assessment

**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'-(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

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## 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:  
100 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'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

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

## piperazine:

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

## Aminoethylpiperazine:

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



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**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:  $\geq 56.3$  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/m<sup>3</sup>

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/m<sup>3</sup>

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

Aminoethylpiperazine:

Species: Rat, male and female

NOAEL: 152 mg/kg/d

Application Route: Oral

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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/m<sup>3</sup>  
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/m<sup>3</sup>  
Application Route: Inhalation  
Exposure time: 90 d  
Number of exposures: 6h/d, 5d/week  
Method: OECD Test Guideline 413

Repeated dose toxicity - : No data available  
Assessment

**Aspiration toxicity**

No data available

**Experience with human exposure**

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

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**Further information****Product:**

Remarks: No data available

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:**

N'-(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)): 11,800 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  
Method: Directive 67/548/EEC, Annex V, C.1.

Aminoethylpiperazine:

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

**Components:**

N'-(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 : 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  
Method: Directive 67/548/EEC, Annex V, C.2.

Aminoethylpiperazine:  
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 58 mg/l  
Exposure time: 48 h  
Test Type: static test  
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

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Test substance: Fresh water

piperazine:

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]propionitrile:

Toxicity to microorganisms : 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:

Toxicity to microorganisms : 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:

Toxicity to microorganisms : 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:

Toxicity to soil dwelling organisms : 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'-(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

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<sub>2</sub>/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 %  
  
Test Type: Water

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-dimethylpropane-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:

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

piperazine:  
Partition coefficient: n-octanol/water : log Pow: -1.17  
  
log Pow: -1.24 (25 °C)

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

### Mobility in soil

Mobility : No data available

### Components:

Triethanolamine:  
Distribution among environmental compartments : Koc: 18  
piperazine:  
Distribution among environmental compartments : Koc: 507Method: OECD Test Guideline 106  
Aminoethylpiperazine:  
Distribution among environmental compartments : Koc: ca. 37000  
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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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**

UN/ID No. : UN 2735  
Proper shipping name : Amines, liquid, corrosive, n.o.s.  
(DIMETHYL DIPROPYL TRIAMINE)  
Class : 8  
Packing group : II  
Labels : Corrosive  
Packing instruction (cargo aircraft) : 855  
Packing instruction (passenger aircraft) : 851

**IMDG**

UN number : UN 2735  
Proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.  
(DIMETHYL DIPROPYL TRIAMINE)  
Class : 8  
Packing group : II  
Labels : 8  
EmS Code : F-A, S-B  
Marine pollutant : no

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

Not applicable for product as supplied.

**National Regulations**

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|----------------|------------------------------|-----------------------------|--|

### DOT Classification

|                      |   |
|----------------------|---|
| UN/ID/NA number      | : UN 2735   |
| Proper shipping name | : AMINES, LIQUID, CORROSIVE, N.O.S.<br>(DIMETHYL DIPROPYL TRIAMINE) |
| Class                | : 8   |
| Packing group        | : II  |
| Labels               | : CORROSIVE   |
| ERG Code             | : 153   |
| Marine pollutant     | : no  |

## SECTION 15. REGULATORY INFORMATION

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

#### CERCLA Reportable Quantity

| Components          | CAS-No.  | Component RQ<br>(lbs) | Calculated product RQ<br>(lbs) |
|---------------------|----------|-----------------------|--------------------------------|
| 2,2'-iminodiethanol | 111-42-2 | 100                   | *                              |

\*: 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   |
| NZIoC  | : 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   |
| TCSI   | : Not in compliance with the inventory   |

### Inventories



# SAFETY DATA SHEET

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Enriching lives through innovation

## ARADUR® 8604 US

|                |                              |                             |  |
|----------------|------------------------------|-----------------------------|--|
| Version<br>1.0 | Revision Date:<br>11/17/2016 | SDS Number:<br>400001012854 | Date of last issue: -<br>Date of first issue: 11/17/2016 |
|----------------|------------------------------|-----------------------------|--|

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (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.

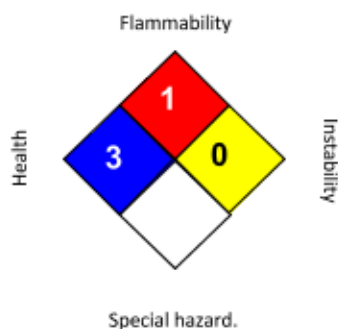
### US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

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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## ARADUR® 8604 US

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

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