SECTION 1. IDENTIFICATION

Product name: ARALDITE® 2014-2 RESIN

Manufacturer or supplier’s details
Company name of supplier: Huntsman Advanced Materials Americas LLC
Address: 2795 Slough Avenue
Mississauga, ON L4T 1G2, Canada
Telephone: +1 905 678 9150
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: Epoxy constituents

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Skin irritation: Category 2
Serious eye damage: Category 1
Skin sensitisation: Category 1
Acute aquatic toxicity: Category 2
Chronic aquatic toxicity: Category 2

GHS label elements
Hazard pictograms:

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

Precautionary statements: Prevention:
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should 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 water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it 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

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A epoxy resin</td>
<td>25068-38-6</td>
<td>30 - 40</td>
</tr>
<tr>
<td>barium sulfate</td>
<td>7727-43-7</td>
<td>30 - 40</td>
</tr>
<tr>
<td>Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol</td>
<td>9003-36-5</td>
<td>10 - 20</td>
</tr>
<tr>
<td>1,4-bis(2,3-epoxypropoxy)butane</td>
<td>2425-79-8</td>
<td>2.5 - 3</td>
</tr>
<tr>
<td>bis(2,3-epoxypropyl) terephthalate</td>
<td>7195-44-0</td>
<td>1 - 2.5</td>
</tr>
<tr>
<td>tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate</td>
<td>7237-83-4</td>
<td>0.25 - 1</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

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

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

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

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

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

### Notes to physician:
- Treat symptomatically.

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### 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.

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### SECTION 6. ACCIDENTAL RELEASE MEASURES

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

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

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

SECTION 7. HANDLING AND STORAGE

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

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

Sudden Release of Pressure Hazard

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. Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid: Strong acids
Strong bases
Strong oxidizing agents

Recommended storage temperature: 2 - 40 °C

Further information on storage stability: No decomposition if stored and applied as directed.

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</th>
<th>Basis</th>
</tr>
</thead>
</table>

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Personal protective equipment
Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Recommended Filter type: Combined particulates and organic vapour type
Filter type: Filter type A-P
Hand protection
Material: butyl-rubber
Material: Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time: > 8 h
Material: Nitrile rubber
Material: Neoprene rubber
Break through time: 10 - 480 min
Remarks: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
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: beige
Odour: slight
Odour Threshold: No data is available on the product itself.

pH: ca. 7 (20 °C)
Concentration: 500 g/l

Melting point/freezing point: No data available

Boiling point/boiling range: > 200 °C

Flash point: > 100 °C
Method: 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 / Upper flammability limit: No data is available on the product itself.

Lower explosion limit / Lower flammability limit: No data is available on the product itself.

Vapour pressure: < 1.33 hPa (20 °C)

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

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

Density: 1.6 g/cm3 (25 °C)

Solubility(ies)
Water solubility: practically insoluble (20 °C)

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: does not ignite

Decomposition temperature: > 200 °C

Self-Accelerating decomposition temperature (SADT): No data is available on the product itself.

Viscosity
Viscosity, dynamic: 92,800 mPa.s (25 °C)
Method: Other guidelines

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 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
Incompatible materials : No data available
HNADIZ ous decomposition products : Carbon oxides
Burning produces noxious and toxic fumes.

SECTION 11. TOXICOLOGICAL INFORMATION

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

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

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

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

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

Skin corrosion/irritation
Product: Remarks: May cause skin irritation and/or dermatitis.
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:**

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

barium sulfate:
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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

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

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

1,4-bis(2,3-epoxypropoxy)butane:
Genotoxicity in vitro: Concentration: 10 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive


Remarks: Not classified due to data which are conclusive although insufficient for classification.

Concentration: 1 - 100 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
Remarks: Not classified due to data which are conclusive although insufficient for classification.

**bis(2,3-epoxypropyl) terephthalate:**
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive

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

**tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:**
Genotoxicity in vitro: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive

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

**Components:**

**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

**Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:**
Genotoxicity in vivo: Cell type: Somatic
Application Route: Oral
Exposure time: 48 h
Dose: 2000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 486
Result: negative
1,4-bis(2,3-epoxypropoxy)butane:
Genotoxicity in vivo: Test Type: In vivo micronucleus test
   Species: Mouse
   Cell type: Somatic
   Application Route: Oral
   Exposure time: 4 d
   Dose: 187.5 - 750 mg/kg
   Method: OECD Test Guideline 474
   Result: negative

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

bis(2,3-epoxypropyl) terephthalate:
Genotoxicity in vivo: Application Route: Oral
   Method: OECD Test Guideline 483
   Result: negative

   Application Route: Oral
   Method: OECD Test Guideline 474
   Result: negative

tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:
Genotoxicity in vivo: Application Route: Oral
   Method: OECD Test Guideline 483
   Result: negative

   Application Route: Oral
   Method: OECD Test Guideline 474
   Result: negative

Components:
1,4-bis(2,3-epoxypropoxy)butane:
Germ cell mutagenicity-Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Germ cell mutagenicity-Assessment: No data available

Carcinogenicity
Components:
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

Species: Rat, (male and female)  
Application Route: Oral  
Exposure time: 104 weeks  
Dose: 60 - 75 mg/kg  
Method: OPPTS 870.4200  
Result: negative

Species: Mouse, (male and female)  
Application Route: Oral  
Dose: 160 - 200 mg/kg  
Method: OPPTS 870.4200  
Result: negative

Carcinogenicity Assessment: No data available

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.

Reproductive toxicity

Components: 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.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Components:
Bisphenol A epoxy resin:
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
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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Species: Rabbit, female
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight
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
Components:
Bisphenol A epoxy resin:
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

barium sulfate:
Species: Rat
LOEC: >= 104 mg/kg, 40 mg/m3
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 5 h
Number of exposures: 5 d
Method: Subchronic toxicity

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Species: Rat, male and female
NOAEL: 250 mg/kg
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

1,4-bis(2,3-epoxypropoxy)butane:
Species: Rat, male and female
NOAEL: 200 mg/kg
Application Route: Ingestion
Exposure time: 28 d
Number of exposures: 7 d
Method: Subacute toxicity

bis(2,3-epoxypropyl) terephthalate:
Species: Rat, male and female
NOAEL: > 240 mg/kg
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d
Method: Subacute toxicity

tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:
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Species: Rat, male
NOAEL: 150 mg/kg/d
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d
Method: Subacute toxicity

Species: Rat, female
NOAEL: >= 500 mg/kg/d
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d
Method: Subacute toxicity

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

Further information
Product: No data available

Other health hazards
No data available
ECOLOGICAL INFORMATION

Ecotoxicity

Components:
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

Barium sulfate:
Toxicity to fish: LC50: 174 mg/l
  Exposure time: 96 h
  Test Type: static test
  Test substance: Fresh water
  Method: OECD Test Guideline 203

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 0.55 mg/l
  Exposure time: 96 h
  Test Type: semi-static test
  Test substance: Fresh water
  Method: OECD Test Guideline 203

1,4-bis(2,3-epoxypropoxy)butane:
Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): 24 mg/l
  Exposure time: 96 h
  Test Type: static test
  Test substance: Fresh water
  Method: OECD Test Guideline 203

Bis(2,3-epoxypropyl) terephthalate:
Toxicity to fish: LC50: 8.8 mg/l
  Exposure time: 96 h
  Test Type: static test
  Test substance: Fresh water
  Method: OECD Test Guideline 203

Tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): > 6.7 mg/l
  Exposure time: 96 h
  Test Type: semi-static test
  Test substance: Fresh water
  Method: OECD Test Guideline 203

Components:
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

Barium sulfate:
<table>
<thead>
<tr>
<th>Component Description</th>
<th>Toxicity to Daphnia and Other Aquatic Invertebrates</th>
<th>Test Type</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol</td>
<td><strong>LC50 (Daphnia magna (Water flea)):</strong> 14.5 mg/l</td>
<td><strong>48 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
<td><strong>Method:</strong> OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td><strong>EC50 (Daphnia magna (Water flea)):</strong> 1.6 mg/l</td>
<td><strong>48 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
<tr>
<td></td>
<td><strong>EC50 (Daphnia magna (Water flea)):</strong> 75 mg/l</td>
<td><strong>24 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
<tr>
<td></td>
<td><strong>EC50 (Daphnia magna (Water flea)):</strong> 81 mg/l</td>
<td><strong>48 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
<tr>
<td></td>
<td><strong>EC50 (Daphnia magna (Water flea)):</strong> 21.7 mg/l</td>
<td><strong>48 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> semi-static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
<tr>
<td><strong>Components:</strong></td>
<td><strong>EC50 (Selenastrum capricornutum (green algae)):</strong> 9.4 mg/l</td>
<td><strong>72 h</strong></td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>Bisphenol A epoxy resin:</td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
<tr>
<td></td>
<td><strong>NOEC:</strong> &gt; 1.15 mg/l</td>
<td><strong>72 h</strong></td>
<td>OECD Test Guideline 201</td>
</tr>
<tr>
<td>barium sulfate:</td>
<td><strong>EC50:</strong> &gt; 100 mg/l</td>
<td><strong>72 h</strong></td>
<td>OECD Test Guideline 201</td>
</tr>
<tr>
<td></td>
<td><strong>Exposure time:</strong></td>
<td><strong>Test Type:</strong> static test</td>
<td><strong>Test substance:</strong> Fresh water</td>
</tr>
</tbody>
</table>
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Toxicity to algae: EC50 (Selenastrum capricornutum (green algae)): 1.8 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

1,4-bis(2,3-epoxypropoxy)butane:

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

bis(2,3-epoxypropyl) terephthalate:

Toxicity to algae: ErC50 (Selenastrum capricornutum (green algae)): 2.94 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Toxicity to algae: EC50 (Selenastrum capricornutum (green algae)): 27.45 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

NOEC (Selenastrum capricornutum (green algae)): 0.6 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

**Components:**

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

M-Factor (Acute aquatic toxicity): 1

Toxicity to fish (Chronic toxicity): No data available

**Components:**

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

Barium sulfate:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):

NOEC (Daphnia magna (Water flea)): 5.8 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

**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:

**Bisphenol A epoxy resin:**

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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

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

**1,4-bis(2,3-epoxypropoxy)butane:**

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

**tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:**

- **Toxicity to microorganisms:**
  - EC50 (activated sludge): > 1,000 mg/l
  - Exposure time: 3 h
  - Test substance: brackish 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

**Components:**

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

- **Acute aquatic toxicity:**
  - This product has no known ecotoxicological effects.
Chronic aquatic toxicity: Toxic to aquatic life with long lasting effects.

Toxicity Data on Soil: No data available

Other organisms relevant to the environment: No data available

**Persistence and degradability**

**Components:**

**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

**Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:**

Biodegradability:
- Inoculum: activated sludge
- Concentration: 3 mg/l
- Result: Not readily biodegradable.
- Biodegradation: ca. 0%
- Exposure time: 28 d

**1,4-bis(2,3-epoxypropoxy)butane:**

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

**bis(2,3-epoxypropyl) terephthalate:**

Biodegradability:
- Result: Readily biodegradable.
- Biodegradation: 83%
- Exposure time: 28 d
- Method: OECD Test Guideline 301F

**tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:**

Biodegradability:
- Inoculum: Fresh water
- Result: Not biodegradable
- Biodegradation: 59%
- Exposure time: 28 d
- Method: OECD Test Guideline 301F

**Biochemical Oxygen Demand (BOD):**

- No data available

**Chemical Oxygen Demand (COD):**

- No data available

**BOD/COD:**

- No data available
**Components:**

**Bisphenol A epoxy resin:**

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

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

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

**Bis(2,3-epoxypropyl) terephthalate:**

- **Stability in water:** Degradation half life (DT50): 118.26 hrs (20 °C) pH: 7
  - Method: OECD Test Guideline 111
  - GLP: yes
  - Remarks: Fresh water

**Tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:**

- **Stability in water:** Degradation half life (DT50): 101.91 hrs (20 °C) pH: 4
  - Method: OECD Test Guideline 111
  - GLP: yes
  - Remarks: Fresh water

**Bioaccumulative potential**

**Components:**

**Bisphenol A epoxy resin:**

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

**Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:**

- **Bioaccumulation:** Species: Fish
  - Bioconcentration factor (BCF): 150
  - Remarks: Does not bioaccumulate.
Bisphenol A epoxy resin:
Partition coefficient: n-octanol/water : log Pow: 3.242 (25 °C)
pH: 7.1
Method: OECD Test Guideline 117

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Partition coefficient: n-octanol/water : log Pow: 2.7 - 3.6
Method: OECD Test Guideline 117

1,4-bis(2,3-epoxypropoxy)butane:
Partition coefficient: n-octanol/water : log Pow: -0.269 (25 °C)
pH: 6.7
Method: OECD Test Guideline 117

bis(2,3-epoxypropyl) terephthalate:
Partition coefficient: n-octanol/water : log Pow: 1.7 (25 °C)
Method: OECD Test Guideline 117
GLP: yes

tris(oxiranymethyl) benzene-1,2,4-tricarboxylate:
Partition coefficient: n-octanol/water : log Pow: 0.9 (25 °C)
Method: OECD Test Guideline 117

Mobility in soil
Mobility : No data available

Components:
Bisphenol A epoxy resin:
Distribution among environmental compartments : Koc: 445

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Distribution among environmental compartments : Koc: 4460
Method: OECD Test Guideline 121

1,4-bis(2,3-epoxypropoxy)butane:
Distribution among environmental compartments : Koc: 12.59
Method: OECD Test Guideline 121

bis(2,3-epoxypropyl) terephthalate:
Distribution among environmental compartments : Koc: 2
Method: OECD Test Guideline 121

tris(oxiranymethyl) benzene-1,2,4-tricarboxylate:
Distribution among environmental compartments : Koc: 251
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
SAFETY DATA SHEET

ARALDITE® 2014-2 RESIN

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

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

Additional ecological information - Product : 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.

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

SECTION 14. TRANSPORT INFORMATION

International Regulations

TDG
UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)
Class : 9
Packing group : III
Labels : 9

IATA
UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
SAFETY DATA SHEET

ARALDITE® 2014-2 RESIN

Version 1.0  Revision Date: 01/16/2018  SDS Number: 400001015910  Date of last issue: -  Date of first issue: 01/16/2018

(BISPHENOL A EPOXY RESIN, BISPHENOL F 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, BISPHENOL F 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

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

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

SECTION 15. REGULATORY INFORMATION

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

DSL: This product contains one or several components that are not on the Canadian DSL nor NDSL.

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

NZIoC: On the inventory, or 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: Low volume exemption, On the inventory, or in compliance with the inventory
IECSC: Low volume exemption, On the inventory, or in compliance with the inventory
TCSI: On the inventory, or in compliance with the inventory
TSCA: Not On TSCA 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)

Canada. CEPA 1999 Significant New Activity (SNAc) List
No substances are subject to a Significant New Activity Notification.

SECTION 16. OTHER INFORMATION

Further information

NFPA:

Flammability

Health

Physical Hazard

HMIS® IV:

HEALTH

FLAMMABILITY

PHYSICAL HAZARD

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: 01/16/2018

ACGIH: USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1: USA. Occupational Exposure Limits (OSHA) - Table Z-1
Limits for Air Contaminants
ACGIH / TWA: 8-hour, time-weighted average
OSHA Z-1 / TWA: 8-hour time weighted average

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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.

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