SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

ARALDITE® 2015 GB RESIN

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
   Trade name : ARALDITE® 2015 GB RESIN

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Use of the Substance/Mixture : Adhesives

1.3 Details of the supplier of the safety data sheet
   Company : Huntsman Advanced Materials (Europe)BVBA
   Address : Everslaan 45
             3078 Everberg
             Belgium
   Telephone : +41 61 299 20 41
   Telefax : +41 61 299 20 40
   E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

1.4 Emergency telephone number
    Emergency telephone number : EUROPE: +32 35 75 1234
                                France ORFILA: +33(0)145425959
                                ASIA: +65 6336-6011
                                China: +86 20 39377888
                                      +86 532 83889090
                                India: + 91 22 42 87 5333
                                Australia: 1800 786 152
                                New Zealand: 0800 767 437
                                USA: +1/800/424.9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
   Classification (REGULATION (EC) No 1272/2008)
   Skin irritation, Category 2 H315: Causes skin irritation.
   Serious eye damage, Category 1 H318: Causes serious eye damage.
   Skin sensitisation, Category 1 H317: May cause an allergic skin reaction.
   Chronic aquatic toxicity, Category 2 H411: Toxic to aquatic life with long lasting effects.
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 mist or vapours.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
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.

Hazardous components which must be listed on the label:
Bisphenol A epoxy resin
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol
Butanediol diglycidyl ether

Additional Labelling:
EUH205 Contains epoxy constituents. May produce an allergic reaction.

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
</table>

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Section 4: First Aid Measures

4.1 Description of First Aid Measures

General advice: Move out of dangerous area. 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: Immediately flush eye(s) with plenty of water. Remove contact lenses.

For explanation of abbreviations see section 16.
Protect unharmed eye. 
Keep eye wide open while rinsing. 
If eye irritation persists, consult a specialist. 

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

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

4.3 Indication of any immediate medical attention and special treatment needed 

SECTION 5: Firefighting measures 

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

Unsuitable extinguishing media: High volume water jet 

5.2 Special hazards arising from the substance or mixture 
Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses. 

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

5.3 Advice for firefighters 
Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary. 

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

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

SECTION 6: Accidental release measures 

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

6.2 Environmental precautions
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.

6.3 Methods and material for containment and cleaning up

Methods for 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.

6.4 Reference to other sections
None

SECTION 7: Handling and storage

7.1 Precautions for safe handling

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. 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.

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

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

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: 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.

Recommended storage temperature: 2 - 40 °C

Other data: No decomposition if stored and applied as directed.
## 7.3 Specific end use(s)

### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

**Occupational Exposure Limits**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4-dihydroxybenzene</td>
<td>123-31-9</td>
<td>TWA</td>
<td>0.5 mg/m³</td>
<td>GB EH40</td>
</tr>
</tbody>
</table>

Further information: Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used.

**Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:**

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A epoxy resin</td>
<td>Workers</td>
<td>Dermal</td>
<td>Systemic effects, Short-term exposure</td>
<td>8.33 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Systemic effects, Short-term exposure</td>
<td>12.25 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Dermal</td>
<td>Systemic effects, Long-term exposure</td>
<td>8.33 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Systemic effects, Long-term exposure</td>
<td>12.25 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Dermal</td>
<td>Systemic effects, Short-term exposure</td>
<td>3.571 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Oral</td>
<td>Systemic effects, Short-term exposure</td>
<td>0.75 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Dermal</td>
<td>Systemic effects, Long-term exposure</td>
<td>3.571 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Oral</td>
<td>Systemic effects, Long-term exposure</td>
<td>0.75 mg/kg bw/day</td>
</tr>
</tbody>
</table>

**Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:**

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A epoxy resin</td>
<td>Fresh water</td>
<td>0.006 mg/l</td>
</tr>
</tbody>
</table>

Remarks:

- Marine water 0.0006 mg/l
- Freshwater - intermittent 0.018 mg/l
- Fresh water sediment 0.996 mg/kg

Equilibrium method
<table>
<thead>
<tr>
<th>Environment</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine sediment</td>
<td>0.0996 mg/kg</td>
</tr>
<tr>
<td>Soil</td>
<td>0.196 mg/kg</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>10 mg/l</td>
</tr>
<tr>
<td><strong>Assessment Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Secondary Poisoning</td>
<td>11 mg/kg</td>
</tr>
<tr>
<td>Fresh water</td>
<td>0.006 mg/l</td>
</tr>
<tr>
<td>Marine water</td>
<td>0.0006 mg/l</td>
</tr>
<tr>
<td>Freshwater - intermittent</td>
<td>0.018 mg/l</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td>0.996 mg/kg</td>
</tr>
<tr>
<td>Marine sediment</td>
<td>0.0996 mg/kg</td>
</tr>
<tr>
<td>Soil</td>
<td>0.196 mg/kg</td>
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<td>Sewage treatment plant</td>
<td>10 mg/l</td>
</tr>
<tr>
<td><strong>Assessment Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Secondary Poisoning</td>
<td>11 mg/kg</td>
</tr>
<tr>
<td>Fresh water</td>
<td>0.003 mg/l</td>
</tr>
<tr>
<td>Marine water</td>
<td>0.0003 mg/l</td>
</tr>
<tr>
<td>Intermittent use/release</td>
<td>0.0254 mg/l</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td>0.294 mg/kg</td>
</tr>
<tr>
<td>Marine sediment</td>
<td>0.0294 mg/kg</td>
</tr>
<tr>
<td>Soil</td>
<td>0.237 mg/kg</td>
</tr>
</tbody>
</table>
8.2 Exposure controls

Engineering measures
Effective exhaust ventilation system

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

Hand protection
Material: butyl-rubber

Material: Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time: > 8 h

Material: Nitrile rubber

Material: Neoprene gloves
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).

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

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
Appearance: paste
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Colour: beige
Odour: slight
Odour Threshold: No data is available on the product itself.
pH: ca. 6 - 7 (25 °C)
Concentration: 500 g/l

Freezing point: No data is available on the product itself.
Melting point: No data is available on the product itself.
Boiling point: > 200 °C
Flash point: > 150 °C
Method: Pensky-Martens closed cup, closed cup

Evaporation rate: No data is available on the product itself.
Flammability (solid, gas): No data is available on the product itself.
Burning rate: 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: < 0,002 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: 1,4 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: No data is available on the product itself.
Decomposition temperature: > 200 °C

Viscosity
Viscosity, dynamic: thixotropic
Explosive properties : No data is available on the product itself.
Oxidizing properties : No data is available on the product itself.

9.2 Other information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No decomposition if stored and applied as directed.

10.2 Chemical stability
No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions
Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid
Conditions to avoid : No data available

10.5 Incompatible materials
Materials to avoid : Strong acids and strong bases
                     Strong oxidizing agents

10.6 Hazardous decomposition products
Carbon oxides
Burning produces noxious and toxic fumes.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Acute oral toxicity - Product : Acute toxicity estimate : > 2 000 mg/kg
                                Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate : > 20 mg/l
                                     Exposure time: 4 h
                                     Test atmosphere: vapour
                                     Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : > 2 000 mg/kg
                                  Method: Calculation method

Acute toxicity (other routes of administration) : No data available
Skin corrosion/irritation

**Components:**
- Bisphenol A epoxy resin:
  - Species: Rabbit
  - Assessment: Mild skin irritant
  - Method: OECD Test Guideline 404
  - Result: Irritating to skin.

- Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
  - Species: Rabbit
  - Method: OECD Test Guideline 404
  - Result: Irritating to skin.

- Butanedioldiglycidyl ether:
  - Species: Rabbit
  - Method: OECD Test Guideline 404
  - Result: Skin irritation

- 1,4-dihydroxybenzene:
  - Species: Rabbit
  - Assessment: No skin irritation
  - Result: No skin irritation

Serious eye damage/eye irritation

**Components:**
- Bisphenol A epoxy resin:
  - Species: Rabbit
  - Assessment: Mild eye irritant
  - Method: OECD Test Guideline 405
  - Result: Irritating to eyes.

- Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
  - Species: Rabbit
  - Method: OECD Test Guideline 405
  - Result: No eye irritation

- Butanedioldiglycidyl ether:
  - Species: Rabbit
  - Method: OECD Test Guideline 405
  - Result: Risk of serious damage to eyes.

- Dipentaerythritol pentaacrylate:
  - Result: Eye irritation

- 1,4-dihydroxybenzene:
  - Assessment: Risk of serious damage to eyes.
  - Result: Risk of serious damage to eyes.

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

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

Butanedioldiglycidyl ether:
Genotoxicity in vitro
- Concentration: 10 - 5000 ug/plate
  Metabolic activation: with and without metabolic activation
  Method: OECD Test Guideline 471
  Result: positive
- Concentration: 1 - 100 µg/L
  Metabolic activation: with and without metabolic activation
  Method: OECD Test Guideline 473
  Result: positive

Bisphenol A - epoxy resins, number average MW >700 - <1100:
Genotoxicity in vitro
- Metabolic activation: with and without metabolic activation
  Method: OECD Test Guideline 476
  Result: positive
**ARALDITE® 2015 GB RESIN**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue: 18.11.2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>16.02.2017</td>
<td>400001015909</td>
<td>Date of first issue: 07.04.2016</td>
</tr>
</tbody>
</table>

- **Concentration:** 0 - 5000 ug/plate
  - **Metabolic activation:** with and without metabolic activation
  - **Method:** OECD Test Guideline 471
  - **Result:** positive

- **1,4-dihydroxybenzene:**
  - **Genotoxicity in vitro**
    - **Metabolic activation:** with and without metabolic activation
    - **Result:** positive

  - **Test Type:** Ames test
    - **Test species:** Salmonella typhimurium
    - **Metabolic activation:** with and without metabolic activation
    - **Method:** OECD Test Guideline 471
    - **Result:** negative
    - **GLP:** yes

  - **Test Type:** Chromosome aberration test in vitro
    - **Test species:** Human lymphocytes
    - **Metabolic activation:** with and without metabolic activation
    - **Method:** OECD Test Guideline 473
    - **Result:** negative
    - **GLP:** yes

  - **Test Type:** Chromosome aberration test in vitro
    - **Test species:** Chinese hamster ovary cells
    - **Metabolic activation:** with and without metabolic activation
    - **Method:** OECD Test Guideline 476
    - **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

Butanedioldiglycidyl ether:
Genotoxicity in vivo

Test Type: In vivo micronucleus test
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
Test species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

bisphenol A - epoxy resins, number average MW >700 - <1100:
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

1,4-dihydroxybenzene:
Genotoxicity in vivo

Application Route: Intraperitoneal injection
Method: OECD Test Guideline 483
Result: positive

Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: positive
Components:
Bisphenol A epoxy resin:  
Germ cell mutagenicity-Assessment: Weight of evidence does not support classification as a germ cell mutagen.

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

Bisphenol A - epoxy resins, number average MW >700 - <1100:  
Germ cell mutagenicity-Assessment: Animal testing did not show any mutagenic effects.

1,4-dihydroxybenzene:  
Germ cell mutagenicity-Assessment: In vitro tests showed mutagenic effects

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

bisphenol A - epoxy resins, number average MW >700 - <1100:
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 24 month(s)
Dose: 15 mg/kg
Frequency of Treatment: 7 daily
Method: OECD Test Guideline 453
Result: negative

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

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

1,4-dihydroxybenzene:
Species: Rat
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 5 daily
Method: OECD Test Guideline 453
Result: positive

Species: Mouse
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 5 daily
Method: OECD Test Guideline 453
Result: positive

Components:
- bisphenol A - epoxy resins, number average MW >700 - <1100:
  Carcinogenicity: Animal testing did not show any carcinogenic effects.
  Assessment
- 1,4-dihydroxybenzene:
Carcinogenicity - Assessment: Limited evidence of carcinogenicity in animal studies

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.

Bisphenol A - epoxy resins, number average MW >700 - <1100:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

1,4-dihydroxybenzene:
Species: Rat
Application Route: Oral
Method: EPA OTS 798.4100

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

bisphenol A - epoxy resins, number average MW >700 - <1100:
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

1,4-dihydroxybenzene:
Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 100 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 25 mg/kg body weight
Method: EPA OTS 798.4900
Result: No teratogenic effects
Components:
bisphenol A - epoxy resins, number average MW >700 - <1100:
Reproductive toxicity - Assessment: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

STOT - single exposure
No data available

STOT - repeated exposure
No data available

Repeated dose toxicity

Components:
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

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

Butanedioldiglycidyl ether:
Species: Rat, male and female
NOAEL: 200 mg/kg
Application Route: Ingestion
Exposure time: 28 d
Number of exposures: 7 d
Method: Subacute toxicity

bisphenol A - epoxy resins, number average MW >700 - <1100:
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

1,4-dihydroxybenzene:
Species: Mouse
LOAEL: 100
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Species: Rat
LOAEL: 100
Application Route: Ingestion
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Species: Rat
NOAEL: 109.6
Application Route: Skin contact
Exposure time: 13 Weeks
Number of exposures: 5 d
Method: Subchronic toxicity

Repeated dose toxicity - : No data available
Assessment

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available
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

12.1 Toxicity

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

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

Toxicity to algae:
- EC50 (Selenastrum capricornutum (green algae)): 9,4 mg/l
  - Exposure time: 72 h
  - Test Type: static test
  - Test substance: Fresh water
  - Method: EPA-660/3-75-009

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC: 0,3 mg/l
  - Exposure time: 21 d
  - Species: Daphnia magna (Water flea)
  - 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 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

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 1,6 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

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

M-Factor (Acute aquatic toxicity):
1

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
NOEC: 0,3 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Ecotoxicology Assessment
Acute aquatic toxicity:
This product has no known ecotoxicological effects.

Chronic aquatic toxicity:
Toxic to aquatic life with long lasting effects.

Butanedioldiglycidyl ether:

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

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 75 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

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

1,4-dihydroxybenzene:
- Toxicity to fish:
  - LC50 (Oncorhynchus mykiss (rainbow trout)): 0.638 mg/l
  - Exposure time: 96 h
  - Test Type: flow-through test
  - Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:
- EC50 (Daphnia magna (Water flea)): 0.134 mg/l
  - Exposure time: 48 h
  - Test Type: semi-static test
  - Method: OECD Test Guideline 202
  - GLP: yes

Toxicity to algae:
- ErC50 (Selenastrum capricornutum (green algae)): 0.33 mg/l
  - Exposure time: 72 h
  - Test Type: static test
  - Method: OECD Test Guideline 201
  - GLP: yes

M-Factor (Acute aquatic toxicity):
- 10

Toxicity to microorganisms:
- IC50 (activated sludge): 71 mg/l
  - Exposure time: 2 h
  - GLP:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC: 0.0057 mg/l
  - Exposure time: 21 d
  - Species: Daphnia magna (Water flea)
  - Test Type: semi-static test
  - Method: OECD Test Guideline 211
  - GLP: yes

12.2 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

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

**Remarks:**
- Fresh water

### Butanedioldiglycidyl ether:

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

### bisphenol A - epoxy resins, number average MW >700 - <1100:

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

### Stability in water:

**Degradation half life (DT50):**
- pH: 4
- Method: OECD Test Guideline 111
- Remarks: Fresh water

**Degradation half life (DT50):**
- pH: 9
- Method: OECD Test Guideline 111
- Remarks: Fresh water

**Degradation half life (DT50):**
- pH: 7
- Method: OECD Test Guideline 111
- Remarks: Fresh water

### 1,4-dihydroxybenzene:

**Biodegradability:**
- Test Type: aerobic
- Inoculum: activated sludge
Concentration: 100 mg/l  
Result: Readily biodegradable.  
Biodegradation: 70 %  
Exposure time: 14 d  
Method: OECD Test Guideline 301C

12.3 Bioaccumulative potential

**Components:**

- **Bisphenol A epoxy resin:**
  - Bioaccumulation: Bioconcentration factor (BCF): 31  
  - Remarks: Does not bioaccumulate.
  - 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:**
  - Bioaccumulation: Species: Fish  
  - Bioconcentration factor (BCF): 150  
  - Remarks: Does not bioaccumulate.
  - Partition coefficient: n-octanol/water: log Pow: 2.7 - 3.6  
  - Method: OECD Test Guideline 117

- **Butanedioldiglycidyl ether:**
  - Bioaccumulation: Distribution among environmental compartments: Koc: 445  
  - pH: 6.7  
  - Method: OECD Test Guideline 117

- **Bisphenol A - epoxy resins, number average MW >700 - <1100:**
  - Bioaccumulation: Species: Fish  
  - Bioconcentration factor (BCF): 31  
  - Remarks: Does not bioaccumulate.

- **1,4-dihydroxybenzene:**
  - Bioaccumulation: Bioconcentration factor (BCF): 3.16
  - Partition coefficient: n-octanol/water: log Pow: 0.59

12.4 Mobility in soil

**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

- **Butanedioldiglycidyl ether:**
Distribution among environmental compartments: Koc: 12.59
Method: OECD Test Guideline 121

bisphenol A - epoxy resins, number average MW >700 - <1100:
Distribution among environmental compartments: Koc: 445

12.5 Results of PBT and vPvB assessment
Product:
Assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product: 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

IATA
14.1 UN number: UN 3082
14.2 UN proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)
14.3 Transport hazard class(es): 9
14.4 Packing group: III
Labels: Miscellaneous
Packing instruction (cargo aircraft): 964
PACKING INSTRUCTION (PASSenger AIRCRAFT):

- UN 3082
- ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)
- Transport hazard class(es): 9
- Packing group: III
- Labels: F-A, S-F
- Marine pollutant: yes

ENVIRONMENTALLY HAZARDOUS: yes

TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL AND THE IBC CODE

Not applicable for product as supplied.

Other regulations:
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

- DSL: This product contains one or several components listed in the Canadian NDSL.
- 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: On the inventory, or in compliance with the inventory
- PICCS: On the inventory, or in compliance with the inventory
- IECSC: On the inventory, or in compliance with the inventory
- TCSI: On the inventory, or in compliance with the inventory
- TSCA: On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical safety assessment

SECTION 16: Other information

Full text of H-Statements:

<table>
<thead>
<tr>
<th>H302</th>
<th>Harmful if swallowed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H312</td>
<td>Harmful in contact with skin.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**


**ARALDITE® 2015 GB RESIN**

<table>
<thead>
<tr>
<th>Version</th>
<th>SDS Number: 400001015909</th>
<th>Date of last issue: 18.11.2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>16.02.2017</td>
<td>Date of first issue: 07.04.2016</td>
</tr>
</tbody>
</table>

H319 : Causes serious eye irritation.
H332 : Harmful if inhaled.
H341 : Suspected of causing genetic defects.
H351 : Suspected of causing cancer.
H400 : Very toxic to aquatic life.
H410 : Very toxic to aquatic life with long lasting effects.
H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations:

- Acute Tox. : Acute toxicity
- Aquatic Acute : Acute aquatic toxicity
- Aquatic Chronic : Chronic aquatic toxicity
- Carc. : Carcinogenicity
- Eye Dam. : Serious eye damage
- Eye Irrit. : Eye irritation
- Muta. : Germ cell mutagenicity
- Skin Irrit. : Skin irritation
- Skin Sens. : Skin sensitisation

Further information:

<table>
<thead>
<tr>
<th>Classification of the mixture:</th>
<th>Classification procedure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Irrit. 2 H315</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Eye Dam. 1 H318</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Skin Sens. 1 H317</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 2 H411</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

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

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

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

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<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
<th>Date of first issue:</th>
</tr>
</thead>
</table>

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.
ARALDITE® 2015 GB HARDENER

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
   Trade name : ARALDITE® 2015 GB HARDENER

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Use of the Substance/Mixture : Hardener

1.3 Details of the supplier of the safety data sheet
   Company : Huntsman Advanced Materials (Europe)BVBA
   Address : Everslaan 45
             3078 Everberg
             Belgium
   Telephone : +41 61 299 20 41
   Telefax : +41 61 299 20 40
   E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.com

1.4 Emergency telephone number
   Emergency telephone number : EUROPE: +32 35 75 1234
                                 France ORFILA: +33(0)145425959
                                 ASIA: +65 6336-6011
                                 China: +86 20 39377888
                                        +86 532 83889090
                                 India: +91 22 42 87 5333
                                 Australia: 1800 786 152
                                 New Zealand: 0800 767 437
                                 USA: +1/800/424.9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
   Classification (REGULATION (EC) No 1272/2008)
   Acute toxicity, Category 4 : H332: Harmful if inhaled.
   Skin corrosion, Category 1B : H314: Causes severe skin burns and eye damage.
   Skin sensitisation, Category 1 : H317: May cause an allergic skin reaction.
   Chronic aquatic toxicity, Category 2 : H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements
   Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms : [Images of hazard symbols]

Signal word : Danger

Hazard statements : H332 Harmful if inhaled.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : Prevention:
P261 Avoid breathing mist or vapours.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P273 Avoid release to the environment.

Response:
P301 IF SWALLOWED:
P310 Immediately call a POISON CENTER/doctor.
P331 Do NOT induce vomiting.
P303 + P361 + P353 + P310 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. 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.

Hazardous components which must be listed on the label:
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated

Diethyleneetriamine

Aminoethylpiperazine

2,4,6-tris(dimethylaminomethyl)phenol

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components
### SECTION 4: First aid measures

#### 4.1 Description of 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.

---

**Chemical name**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Registration number</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated</td>
<td>68683-29-4</td>
<td></td>
<td></td>
<td>Skin Sens. 1; H317 Skin Irrit. 2; H315</td>
<td>13 - 30</td>
</tr>
<tr>
<td>Bis(isopropyl)naphthalene</td>
<td>38640-62-9</td>
<td>254-052-6</td>
<td>-</td>
<td>Asp. Tox. 1; H304 Aquatic Chronic 1; H410</td>
<td>7 - 13</td>
</tr>
<tr>
<td>2,2'-Iminodi(ethylamine)</td>
<td>111-40-0</td>
<td>203-865-4</td>
<td>01-2119473793-27</td>
<td>Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 STOT SE 3; H335</td>
<td>3 - 7</td>
</tr>
<tr>
<td>2-Piperazin-1-ylethylamine</td>
<td>140-31-8</td>
<td>205-411-0</td>
<td>01-2119471486-30</td>
<td>Acute Tox. 4; H302 Acute Tox. 3; H311 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412</td>
<td>1 - 3</td>
</tr>
<tr>
<td>2,4,6-Tris(dimethylaminomethyl)phenol</td>
<td>90-72-2</td>
<td>202-013-9</td>
<td>01-2119560597-27</td>
<td>Acute Tox. 4; H302 Skin Corr. 1C; H314 Eye Dam. 1; H318 Aquatic Chronic 3; H412 Skin Sens. 1B; H317</td>
<td>1 - 3</td>
</tr>
<tr>
<td>4,4'-Isopropylidenediphenol</td>
<td>80-05-7</td>
<td>201-245-8</td>
<td>01-2119457856-23</td>
<td>Eye Dam. 1; H318 Skin Sens. 1; H317 Repr. 2; H361f STOT SE 3; H335 Aquatic Chronic 2; H411</td>
<td>0.1 - 1</td>
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<td>Amines, polyethylenepoly-, triethylenetetramine fraction</td>
<td>90640-67-8</td>
<td></td>
<td>01-2119487919-13</td>
<td>Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Skin Sens. 1; H317 Aquatic Chronic 3; H412</td>
<td>0.1 - 1</td>
</tr>
</tbody>
</table>

For explanation of abbreviations see section 16.
If inhaled: Consult a physician after significant exposure. If unconscious place in recovery position and seek medical advice.

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

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

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

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

4.3 Indication of any immediate medical attention and special treatment needed
Treatment: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

SECTION 5: Firefighting measures

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

Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture
Specific hazards during: Do not allow run-off from fire fighting to enter drains or water
firefighting courses.

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

5.3 Advice for firefighters

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

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

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment. Ensure adequate ventilation.

6.2 Environmental precautions

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.

6.3 Methods and material for containment and cleaning up

Methods for 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.

6.4 Reference to other sections

None

SECTION 7: Handling and storage

7.1 Precautions for safe handling

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.

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

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

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers: Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Other data: No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylenetriamine</td>
<td>111-40-0</td>
<td>TWA</td>
<td>1 ppm 4.3 mg/m³</td>
<td>GB EH40</td>
</tr>
<tr>
<td>Further information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can be absorbed through skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity., Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80-05-7</td>
<td>TWA (inhalable dust)</td>
<td>10 mg/m³</td>
<td>GB EH40</td>
</tr>
<tr>
<td>Further information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (inhalable dust)</td>
<td>10 mg/m³</td>
<td>2009/161/EU</td>
</tr>
<tr>
<td>Further information</td>
<td></td>
<td>Indicative</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylenetriamine</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Systemic effects, Short-term exposure</td>
<td>92.1 mg/m³</td>
</tr>
</tbody>
</table>
### Workers

**Inhalation**

Local effects, Short-term exposure: 2.6 mg/m³

**Dermal**

Systemic effects, Long-term exposure: 11.4 mg/kg bw/day

**Local effects, Long-term exposure**

- Local effects: 1.1 mg/cm²
- Systemic effects: 0.87 mg/m³

**Systemic effects, Long-term exposure**

- Inhalation: 15.4 mg/m³
- Dermal: 11.4 mg/kg bw/day

**naphthalene, bis(1-methylethyl)**

**Inhalation**

Systemic effects, Long-term exposure: 30 mg/m³

**Dermal**

Systemic effects, Long-term exposure: 4.88 mg/kg bw/day

**Local effects, Short-term exposure**

- Dermal: 0.04 mg/cm²
- Local effects: 0.006 mg/cm²

**Systemic effects, Short-term exposure**

- Inhalation: 27.5 mg/m³
- Dermal: 4.3 mg/kg bw/day

**Aminoethylpiperazine**

**Inhalation**

Systemic effects, Long-term exposure: 3.6 mg/m³

**Dermal**

Systemic effects, Short-term exposure: 20 mg/kg bw/day

Local effects, Short-term exposure: 0.04 mg/cm²

Systemic effects, Long-term exposure: 3.3 mg/kg bw/day

**Local effects, Long-term exposure**

- Dermal: 0.006 mg/cm²
- Local effects: 0.02 mg/cm²

**Systemic effects, Long-term exposure**

- Inhalation: 5.3 mg/m³
- Oral: 0.3 mg/kg bw/day

**Dermal**

Local effects, Short-term exposure: 1.7 mg/kg bw/day

**Systemic effects, Long-term exposure**

- Inhalation: 0.04 mg/cm²
- Oral: 0.3 mg/kg bw/day

**Local effects, Long-term exposure**

- Dermal: 0.02 mg/cm²
- Local effects: 10 mg/kg

---

**Consumers**

**Oral**

Systemic effects, Long-term exposure: 2.1 mg/kg bw/day

**Inhalation**

Systemic effects, Short-term exposure: 5.3 mg/m³

**Dermal**

Systemic effects, Long-term exposure: 0.3 mg/kg bw/day

Local effects, Short-term exposure: 0.02 mg/cm²

**Systemic effects, 10 mg/kg**
### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylenetriamine</td>
<td>Fresh water</td>
<td>0.56 mg/l</td>
</tr>
<tr>
<td>Remarks:</td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td>Marine water</td>
<td></td>
<td>0.056 mg/l</td>
</tr>
<tr>
<td>Assessment Factors</td>
<td>Fresh water sediment</td>
<td>1072 mg/kg</td>
</tr>
<tr>
<td>Equilibrium method</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ARALDITE® 2015 GB HARDENER**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue</th>
<th>Date of first issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>17.05.2016</td>
<td>400001015913</td>
<td>10.05.2016</td>
<td>13.04.2016</td>
</tr>
</tbody>
</table>

**Short-term exposure bw/day**

- **Consumers**
  - Inhalation: Systemic effects, Long-term exposure
    - 0.9 mg/m³
  - Oral: Systemic effects, Short-term exposure
    - 1.5 mg/kg bw/day
  - Dermal: Local effects, Long-term exposure
    - 0.003 mg/cm²

- **Workers**
  - Inhalation: Systemic effects, Short-term exposure
    - 21.4 mg/m³
  - Dermal: Systemic effects, Long-term exposure
    - 0.31 mg/m³

**2,4,6-tris(dimethylaminomethyl)phenol**

- **Workers**
  - Inhalation: Systemic effects, Short-term exposure
    - 5380 mg/m³
  - Dermal: Systemic effects, Long-term exposure
    - 0.57 mg/kg bw/day
  - Inhalation: Systemic effects, Long-term exposure
    - 1 mg/m³
  - Dermal: Local effects, Long-term exposure
    - 0.028 mg/m³

- **Consumers**
  - Dermal: Systemic effects, Short-term exposure
    - 8 mg/kg bw/day
  - Inhalation: Systemic effects, Short-term exposure
    - 1600 mg/m³
  - Oral: Systemic effects, Short-term exposure
    - 20 mg/kg bw/day
  - Dermal: Local effects, Short-term exposure
    - 1 mg/cm²
  - Inhalation: Systemic effects, Long-term exposure
    - 0.25 mg/kg bw/day
  - Inhalation: Systemic effects, Long-term exposure
    - 0.29 mg/m³
  - Oral: Systemic effects, Long-term exposure
    - 0.41 mg/kg bw/day
  - Dermal: Local effects, Long-term exposure
    - 0.43 mg/cm²

**Remarks**

- Marine water: 0.056 mg/l
- Fresh water sediment: 1072 mg/kg

**Equilibrium method**
<table>
<thead>
<tr>
<th>Substance</th>
<th>Environment</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>naphthalene, bis(1-methylethyl)</td>
<td>Marine sediment</td>
<td>107.2 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>7.97 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method, Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.32 mg/l</td>
</tr>
<tr>
<td>Aminoethylpiperazine</td>
<td>Marine water</td>
<td>0.026 µg/l</td>
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<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>0.15 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>0.94 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
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</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.094 mg/kg</td>
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<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.1872 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary Poisoning</td>
<td>25 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>0.058 mg/l</td>
</tr>
<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.0058 mg/l</td>
</tr>
<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.58 mg/l</td>
</tr>
<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>215 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>21.5 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>42.9 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Equilibrium method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>250 mg/l</td>
</tr>
<tr>
<td></td>
<td>Assessment Factors</td>
<td></td>
</tr>
</tbody>
</table>
8.2 Exposure controls

**Engineering measures**
Effective exhaust ventilation system

**Personal protective equipment**

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

Hand protection  
Material  :  butyl-rubber

Material  :  Ethyl Vinyl Alcohol Laminate (EVAL)

Break through time  :  > 8 h
Material: Nitrile 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).

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

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.
Filter type: Combined particulates and organic vapour type (A-P)
No personal respiratory protective equipment normally required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: paste
Colour: light cream
Odour: amine-like
Boiling point: > 200 °C
Flash point: > 100 °C
Method: Pensky-Martens closed cup, closed cup
Vapour pressure: < 0.49 hPa (20 °C)
Density: 1.4 g/cm³ (25 °C)
Water solubility: practically insoluble (20 °C)
Decomposition temperature: > 200 °C
Viscosity, dynamic: thixotropic
9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions: No decomposition if stored and applied as directed.

10.4 Conditions to avoid

Conditions to avoid: No data available

10.5 Incompatible materials

Materials to avoid: Strong acids and strong bases
Strong oxidizing agents

10.6 Hazardous decomposition products

Burning produces noxious and toxic fumes.
Carbon oxides
Nitrogen oxides (NOx)

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity - Product: Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product: Acute toxicity estimate: 3.12 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity - Product: Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

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

Skin corrosion/irritation

Components:
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated:
Species: Rabbit
Assessment: Moderate skin irritant
Result: Irritating to skin.

Diethylenetriamine:
Species: Rabbit
Result: Causes burns.

Aminoethylpiperazine:
Species: Rabbit
Result: Causes burns.

2,4,6-tris(dimethylaminomethyl)phenol:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Corrosive after 1 to 4 hours of exposure

4,4′-isopropylidenediphenol:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Triethylenetetramine:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Corrosive after 3 minutes to 1 hour of exposure

**Serious eye damage/eye irritation**

**Product:**
Remarks: May cause irreversible eye damage.

**Respiratory or skin sensitisation**

**Components:**
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

naphthalene, bis(1-methylethyl)-:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.

Diethylenetriamine:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: May cause sensitisation by skin contact.
Remarks: Causes sensitisation.

Exposure routes: Respiratory Tract
Species: Mouse
Result: Does not cause respiratory sensitisation.

Aminoethylpiperazine:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

2,4,6-tris(dimethylaminomethyl)phenol:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Assessment: The product is a skin sensitiser, sub-category 1B.
Result: The product is a skin sensitiser, sub-category 1B.

4,4'-isopropylidenediphenol:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: Does not cause skin sensitisation.

Exposure routes: Skin
Species: Humans
Assessment: May cause sensitisation by skin contact.
Result: Causes sensitisation.

Triethylenetetramine:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

Assessment: No data available

Germ cell mutagenicity

Components:
naphthalene, bis(1-methylethyl)-:
Genotoxicity in vitro:
Concentration: 92 mg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Concentration: 40 - 60 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Aminoethylpiperazine:
Genotoxicity in vitro
Concentration: 5000 ug/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

2,4,6-tris(dimethylaminomethyl)phenol:
Genotoxicity in vitro
Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Concentration: 2500 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

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

4,4'-isopropylidenediphenol:
Genotoxicity in vitro
Metabolic activation: with and without metabolic activation
Result: negative

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

Components:
naphthalene, bis(1-methylethyl)-:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 1.92 g/kg
Method: OECD Test Guideline 474
Result: negative

Diethylenetriamine:
Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Dose: 85 - 850 mg/kg
Method: OECD Test Guideline 474
Result: negative

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

4,4'-isopropylidenediphenol:
Genotoxicity in vivo : Method: OECD Test Guideline 474
Result: negative

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

Carcinogenicity

Components:
Diethylenetriamine:
Species: Mouse, (male)
Application Route: Dermal
Dose: 56.3 mg/kg
Frequency of Treatment: 3 daily
Result: negative

4,4'-isopropylidenediphenol:
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 7 daily
Result: negative
Triethylenetetramine:
Species: Mouse, (male)
Application Route: Dermal
Dose: 42 mg/kg
Frequency of Treatment: 3 daily
Method: OECD Test Guideline 451
Result: negative
Carcinogenicity - Assessment : No data available

Reproductive toxicity

Components:
Diethylenetriamine:
Effects on fertility : Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No observed adverse effect level:
30 mg/kg wet weight
Method: OECD Test Guideline 421

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.

2,4,6-tris(dimethylaminomethyl)phenol:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

4,4'-isopropylidenediphenol:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: Embryotoxic effects and adverse effects on the offspring were detected.

Components:
naphthalene, bis(1-methylethyl)-:
Effects on foetal development : Species: Rat, female
Application Route: Oral
General Toxicity Maternal: Lowest observed adverse effect level: 250 mg/kg body weight
Result: No teratogenic effects

Diethylenetriamine: Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
100 mg/kg body weight
Method: OECD Test Guideline 421

Aminoethylpiperazine:
Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
224 - 285 mg/kg body weight
Method: OECD Test Guideline 422
Result: No teratogenic effects

4,4'-isopropylidenediphenol:
Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
< 160 mg/kg body weight
Method: OECD Test Guideline 416
Result: No teratogenic effects

Triethylenetetramine:
Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
> 750 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:
125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

**Components:**

4,4'-isopropylidenediphenol:
Reproductive toxicity - Assessment: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**STOT - single exposure**

**Components:**

Diethylenetriamine:
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

4,4'-isopropylidenediphenol:
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
STOT - repeated exposure
No data available

Repeated dose toxicity

Components:
naphthalene, bis(1-methylethyl)-:
Species: Rat, male and female
NOAEL: 170 mg/kg
Application Route: Ingestion
Exposure time: 4,320 h
Number of exposures: 7 d
Method: Subchronic toxicity

Diethylenetriamine:
Species: Rat, male and female
: 70 - 80
Application Route: Ingestion
Test atmosphere: vapour
Exposure time: 360 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOAEL: 114
Application Route: Skin contact
Exposure time: 9,600 h
Number of exposures: 6 d
Method: Chronic toxicity

Aminoethylpiperazine:
Species: Rat, male and female
NOAEL: 151 - 285
Application Route: Ingestion
Exposure time: 672 h
Method: Subacute toxicity

Species: Rat, male and female
NOAEL: > 1000
Application Route: Skin contact
Exposure time: 696 h
Number of exposures: 5 d
Method: Subacute toxicity

2,4,6-tris(dimethylaminomethyl)phenol:
Species: Rat, male and female
NOEL: 15 mg/kg
Application Route: Ingestion
Exposure time: 1,032 h
Number of exposures: 7 d
Method: Subacute toxicity

4,4'-isopropylidenediphenol:
Species: Dog, male and female
: 75 mg/kg, 10
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 2,160 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
LOAEL: 600 mg/kg
Application Route: Ingestion
Exposure time: 672 h
Number of exposures: 7 d

Method: Subchronic toxicity

Triethylenetetramine:
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 26 Weeks
Number of exposures: 7 d

Method: Subchronic 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
Ingestion: No data available
SECTION 12: Ecological information

12.1 Toxicity

Components:
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-
[2-(1-piperazinyl)ethyl]amino]butyl-terminated:

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 1,000 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae: EC50 (No information available.): > 1,000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

naphthalene, bis(1-methylethyl)-:

Toxicity to fish: LC50 : > 0.5 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Remarks: Aquatic toxicity is unlikely due to low solubility.

Toxicity to daphnia and other aquatic invertebrates: EC50 : > 0.16 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Marine water
Method: OECD Test Guideline 202
Remarks: Aquatic toxicity is unlikely due to low solubility.

EL50 (Daphnia magna (Water flea)): 1.7 mg/l
Exposure time: 48 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae: NOECr (Desmodesmus subspicatus (Scenedesmus subspicatus)): ca. 0.15 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Remarks: Aquatic toxicity is unlikely due to low solubility.

M-Factor (Acute aquatic toxicity): 1

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC: 0.013 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Diethylenetriamine:
Toxicity to fish : LC50 : 430 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 32 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

Toxicity to algae : EbC50 (Selenastrum capricornutum (green algae)): 1,164 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l
Exposure time: 28 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 5.6 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water

Toxicity to soil dwelling organisms : EC50: > 1,000 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

Ecotoxicology Assessment
Acute aquatic toxicity : This product has no known ecotoxicological effects.

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

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.

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

2,4,6-tris(dimethylaminomethyl)phenol:

Toxicity to fish: LC50 (Cyprinus carpio (Carp)): 175 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates: LC50: 718 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Marine water

Toxicity to algae: ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 84 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Ecotoxicology Assessment
Chronic aquatic toxicity: This product has no known ecotoxicological effects.

4,4'-isopropylidenediphenol:

Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 7.5 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50: 3.9 - 10.2 mg/l
Exposure time: 48 h
(Ceriodaphnia dubia (Water flea)):

Toxicity to algae: EC50 (Selenastrum capricornutum (green algae)): 2.5 - 3.1 mg/l
Exposure time: 96 h

Toxicity to fish (Chronic toxicity): NOEC: 0.016 mg/l
Exposure time: 444 d
Species: Pimephales promelas (fathead minnow)
Test Type: flow-through test
Test substance: Fresh water
Method: EPA OPPTS 850.1500
Remarks: Toxic to aquatic organisms.

Ecotoxicology Assessment
Chronic aquatic toxicity: Toxic to aquatic life with long lasting effects.

Triethylentetramine:

Toxicity to fish:
- LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
- Test Type: static test
- Test substance: Fresh water
- Method: EPA OTS 797.1400

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

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

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

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

Ecotoxicology Assessment:
Acute aquatic toxicity: This product has no known ecotoxicological effects.

12.2 Persistence and degradability

Components:
2-propenentriene polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated:

Biodegradability: Result: Not readily biodegradable.

naphthalene, bis(1-methylethyl)-:

Biodegradability:
- Inoculum: activated sludge
- Concentration: 0.2 mg/l
- Result: Not readily biodegradable.
- Biodegradation: 30 - 35 %
- Exposure time: 56 d
- Method: OECD Test Guideline 310

Diethylenetriamine:

Biodegradability: Inoculum: activated sludge
Result: Readily biodegradable
Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D

Photodegradation:
Test Type: Air
Rate constant: 500000
Degradation (direct photolysis): 50 %

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

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

Chemical Oxygen Demand (COD):
560 mg/l

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

2,4,6-tris(dimethylaminomethyl)phenol:
Biodegradability:
Inoculum: activated sludge
Concentration: 2 mg/l
Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

4,4'-isopropylidenediphenol:
Biodegradability:
Result: Not readily biodegradable.
Biodegradation: 1 - 2 %
Exposure time: 28 d

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

Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: OECD Test Guideline 302 A
12.3 Bioaccumulative potential

**Components:**
naphthalene, bis(1-methylethyl)-:
Bioaccumulation
Species: Cyprinus carpio (Carp)
Exposure time: 60 d
Bioconcentration factor (BCF): 770 - 6,400
Test substance: Fresh water
Method: flow-through test

Partition coefficient: n-octanol/water
log Pow: 6.081
Method: QSAR

Diethylenetriamine:
Bioaccumulation
Species: Cyprinus carpio (Carp)
Exposure time: 42 d
Bioconcentration factor (BCF): 0.3 - 6.3
Test substance: Fresh water
Method: flow-through test
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water
log Pow: -1.58 (20 °C)
pH: 7

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

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

2,4,6-tris(dimethylaminomethyl)phenol:
Partition coefficient: n-octanol/water
log Pow: 0.219 (21.5 °C)
Method: OPPTS 830.7550

Triethylenetetramine:
Partition coefficient: n-octanol/water
log Pow: -2.65 (20 °C)
Method: OECD Test Guideline 117

12.4 Mobility in soil

**Components:**
naphthalene, bis(1-methylethyl)-:
Distribution among environmental compartments
Koc: 36108
Method: QSAR

Diethylenetriamine:
Distribution among environmental compartments
Koc: 19111

Aminoethylpiperazine:
Distribution among environmental compartments
Koc: ca. 37000
Triethylenetetramine: Distribution among environmental compartments

Koc: 1584.9 - 5012 Method: OECD Test Guideline 106

12.5 Results of PBT and vPvB assessment

Product: Assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product: Do not dispose of waste into sewer.

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

IATA
14.1 UN number: UN 2735
14.2 UN proper shipping name: Polyamines, liquid, corrosive, n.o.s.

(DIETHYLENE TRIAMINE, DIISOPROPYNAPHTHALENE)

14.3 Transport hazard class(es): 8

14.4 Packing group: II

Labels: Corrosive

Packing instruction (cargo aircraft): 855

Packing instruction (passenger aircraft): 851

IMDG
14.1 UN number: UN 2735
14.2 UN proper shipping name: POLYAMINES, LIQUID, CORROSIVE, N.O.S.

(DIETHYLENE TRIAMINE, DIISOPROPYNAPHTHALENE)

14.3 Transport hazard: 8
class(es)
14.4 Packing group : II
Labels : 8
EmS Code : F-A, S-B

14.5 Environmental hazards
Marine pollutant : yes

ADR
14.1 UN number : UN 2735
14.2 UN proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es) : 8
14.4 Packing group : II
Labels : 8
14.5 Environmental hazards
Marine pollutant : no

RID
14.1 UN number : UN 2735
14.2 UN proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es) : 8
14.4 Packing group : II
Labels : 8
14.5 Environmental hazards
Marine pollutant : no

Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable
REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

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

TSCA : On TSCA Inventory

DSL : All components of this product are on the Canadian DSL
ARALDITE® 2015 GB HARDENER

AICS : On the inventory, or in compliance with the inventory
NZIoC : On the inventory, or in compliance with the inventory
ENCS : On the inventory, or in compliance with the inventory
KECI : On the inventory, or in compliance with the inventory
PICCS : On the inventory, or in compliance with the inventory
IECSC : On the inventory, or in compliance with the inventory

Inventories
AICS (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECl (Korea), NZIOC (New Zealand), PICCS (Philippines), TSCA (United States of America)

15.2 Chemical safety assessment

SECTION 16: Other information

Full text of H-Statements
H302 : Harmful if swallowed.
H304 : May be fatal if swallowed and enters airways.
H311 : Toxic in contact with skin.
H312 : Harmful in contact with skin.
H314 : Causes severe skin burns and eye damage.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H330 : Fatal if inhaled.
H335 : May cause respiratory irritation.
H361f : Suspected of damaging fertility.
H410 : Very toxic to aquatic life with long lasting effects.
H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations
Acute Tox. : Acute toxicity
Aquatic Chronic : Chronic aquatic toxicity
Asp. Tox. : Aspiration hazard
Eye Dam. : Serious eye damage
Repr. : Reproductive toxicity
Skin Corr. : Skin corrosion
Skin Irrit. : Skin irritation
Skin Sens. : Skin sensitisation
STOT SE : Specific target organ toxicity - single exposure

Further information

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