

**ARALDITE® 2031-1 RESIN**

Version 1.1      Revision Date: 05/15/2019      SDS Number: 400001009653      Date of last issue: 04/18/2017  
Date of first issue: 04/18/2017

Print Date 08/13/2020

**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2031-1 RESIN

**Manufacturer or supplier's details**Company name of supplier : Huntsman Advanced Materials Americas LLC  
Address : P.O. Box 4980The Woodlands,  
TX 77387  
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : SDS@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

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

Recommended use : Epoxy constituents

**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with 29 CFR 1910.1200**

Skin irritation : Category 2

Eye irritation : Category 2A

Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 2

Long-term (chronic) aquatic hazard : Category 2

**GHS label elements**

Hazard pictograms :



Signal word : Warning

Hazard statements : H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H411 Toxic to aquatic life with long lasting effects.Precautionary statements : **Prevention:**

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P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
 P264 Wash skin thoroughly after handling.  
 P272 Contaminated work clothing must not be allowed out of the workplace.  
 P273 Avoid release to the environment.  
 P280 Wear protective gloves/ eye protection/ face protection.

**Response:**

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

**Storage:**

Not available

**Disposal:**

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

**Other hazards**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Hazardous components**

| Chemical name   | CAS-No.    | Concentration (% w/w) |
|---|------------|-----------------------|
| 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane | 1675-54-3  | 90 - 100              |
| Glass, oxide, chemicals   | 65997-17-3 | 1 - 5                 |

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

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

**SECTION 4. FIRST AID MEASURES**

General advice : Move out of dangerous area.  
 Show this safety data sheet to the doctor in attendance.  
 Treat symptomatically.  
 Get medical attention if symptoms occur.

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

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- In case of skin contact : If skin irritation persists, call a physician.  
If on skin, rinse well with water.  
If on clothes, remove clothes.
- In case of eye contact : Immediately flush eye(s) with plenty of water.  
Remove contact lenses.  
Keep eye wide open while rinsing.  
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.  
Never give anything by mouth to an unconscious person.  
If symptoms persist, call a physician.
- Most important symptoms and effects, both acute and delayed : None known.
- Notes to physician : Treat symptomatically.

**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : High volume water jet
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides  
Halogenated compounds
- Specific extinguishing methods : No data is available on the product itself.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.

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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**

- Technical measures : Ensure that eyewash stations and safety showers are close to the workstation location.
- Local/Total ventilation : Ensure adequate ventilation.
- 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.  
Dispose of rinse water in accordance with local and national regulations.  
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 36 - 104 °F / 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

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

Contains no substances with occupational exposure limit values.

**Personal protective equipment**

- Respiratory protection : 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

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- Filter type : Filter type A-P
- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
- Hand protection
- Material : butyl-rubber
- Material : Ethyl Vinyl Alcohol Laminate (EVAL)
- Break through time : > 8 h
- Material : Nitrile rubber
- Break through time : 10 - 480 min
- Remarks : 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).  
The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water  
Tightly fitting safety goggles  
Wear face-shield and protective suit for abnormal processing problems.
- Skin and body protection : Impervious clothing  
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : paste
- Colour : black
- Odour : slight
- Odour Threshold : No data is available on the product itself.

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|  |   |  |
|--|---|--|
| pH   | : | ca. 7 (68 °F / 20 °C)<br>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                                      | : | > 392 °F / > 200 °C                                  |
| Flash point  | : | 392 °F / 200 °C<br>Method: Pensky-Martens 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                                    | : | ca. 0.01 hPa (68 °F / 20 °C)                         |
| Relative vapour density                            | : | No data is available on the product itself.          |
| Relative density                                   | : | No data is available on the product itself.          |
| Density  | : | ca. 1.16 g/cm <sup>3</sup> (77 °F / 25 °C)           |
| Solubility(ies)                                    |   |  |
| Water solubility                                   | : | practically insoluble (68 °F / 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                          | : | > 392 °F / > 200 °C                                  |
| Self-Accelerating decomposition temperature (SADT) | : | No data is available on the product itself.          |
| Viscosity  | : | No data is available on the product itself.          |
| Explosive properties                               | : | No data is available on the product itself.          |
| Oxidizing properties                               | : | No data is available on the product itself.          |
| Particle size                                      | : | No data is available on the product itself.          |

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**SECTION 10. STABILITY AND REACTIVITY**

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

Chemical stability : Stable under normal conditions.

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

Conditions to avoid : None known.

Incompatible materials : None known.

Hazardous decomposition products : carbon dioxide  
carbon monoxide  
Halogenated compounds

**SECTION 11. TOXICOLOGICAL INFORMATION**

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

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

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

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

Acute inhalation toxicity : No data available

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****Components:**

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

Species: Rabbit  
Assessment: Mild skin irritant  
Method: OECD Test Guideline 404  
Result: Irritating to skin.

Glass, oxide, chemicals:  
Species: Rabbit

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Assessment: No skin irritation  
Method: OECD Test Guideline 404  
Result: Normally reversible injuries

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Species: Rabbit  
Result: Irritating to eyes.  
Assessment: Mild eye irritant  
Method: OECD Test Guideline 405

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Exposure routes: Skin  
Species: Mouse  
Assessment: May cause sensitisation by skin contact.  
Method: OECD Test Guideline 429  
Result: Causes sensitisation.

Glass, oxide, chemicals:  
Exposure routes: Skin  
Species: Other  
Result: Does not cause skin sensitisation.

Assessment: No data available

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: positive

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

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Genotoxicity in vivo : Cell type: Germ  
Application Route: Oral  
Method: OECD Test Guideline 478  
Result: negative

Cell type: Somatic  
Application Route: Oral  
Dose: 0 - 5000 mg/kg  
Method: OPPTS 870.5395  
Result: negative



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**Carcinogenicity****Components:**

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

Species: Rat, male and female

Application Route: Oral

Exposure time: 24 month(s)

Dose: 15 mg/kg

Frequency of Treatment: 7 days/week

Method: OECD Test Guideline 453

Result: negative

Species: Mouse, male

Application Route: Dermal

Exposure time: 24 month(s)

Dose: 0.1 mg/kg

Frequency of Treatment: 3 days/week

Method: OECD Test Guideline 453

Result: negative

Species: Rat, female

Application Route: Dermal

Exposure time: 24 month(s)

Dose: 1 mg/kg

Frequency of Treatment: 5 days/week

Method: OECD Test Guideline 453

Result: negative

Carcinogenicity - Assessment : No data available

**IARC**Group 2A: Probably carcinogenic to humans  
Glass, oxide, chemicals  
(glass)**ACGIH**

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

**OSHA**

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP**

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

**Reproductive toxicity****Components:**

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

Effects on fertility

: Test Type: Two-generation study

Species: Rat, male and female

Application Route: Oral

Dose: &gt;750 milligram per kilogram

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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.

**Components:**

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

Effects on foetal development : Species: Rabbit, female  
Application Route: Dermal  
General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight  
Method: Other guidelines  
Result: No teratogenic effects

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

Reproductive toxicity - Assessment : No data available

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

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

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

Species: Rat, male and female  
NOAEL: 50 mg/kg  
Application Route: Ingestion  
Exposure time: 14 Weeks  
Number of exposures: 7 d  
Method: Subchronic toxicity

Species: Rat, male and female  
NOEL: 10 mg/kg

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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

Glass, oxide, chemicals:  
Species: Rat, male  
LOEC: 2.4 mg/m<sup>3</sup>  
Test atmosphere: dust/mist  
Exposure time: 2,160 h  
Number of exposures: 6 h  
Method: Directive 67/548/EEC, Annex, B.29

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

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

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

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

Glass, oxide, chemicals:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l  
Exposure time: 96 h  
Test Type: Other guidelines  
Test substance: Fresh water  
Method: OECD Test Guideline 203

**Components:**

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.7 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water

Glass, oxide, chemicals:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l  
Exposure time: 72 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

**Components:**

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

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: EPA-660/3-75-009

Glass, oxide, chemicals:

Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l  
Exposure time: 72 h  
Test Type: semi-static test  
Method: OECD Test Guideline 201

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

Toxicity to fish (Chronic) : No data available

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toxicity)

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.3 mg/l  
 Exposure time: 21 d  
 Test Type: semi-static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211

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

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l  
 Exposure time: 3 h  
 Test Type: static test  
 Test substance: Fresh water

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment Acute aquatic toxicity : No data available

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
 Biodegradability : Inoculum: Sewage (STP effluent)  
 Concentration: 20 mg/l  
 Result: Not readily biodegradable.  
 Biodegradation: 5 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301F

Biochemical Oxygen Demand (BOD) : No data available

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Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

**Components:**

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

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

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

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

Photodegradation : No data available

Impact on Sewage Treatment : No data available

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

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

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

**Components:**

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

Partition coefficient: n-octanol/water : log Pow: 3.242 (77 °F / 25 °C)  
pH: 7.1  
Method: OECD Test Guideline 117

**Mobility in soil**

Mobility : No data available

**Components:**

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

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Distribution among environmental compartments : Koc: 445  
 Stability in soil : No data available

**Other adverse effects**

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

**Hazardous to the ozone layer**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances  
 Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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

Global warming potential (GWP) : No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Can be landfilled or incinerated, when in compliance with local regulations.  
 Where possible recycling is preferred to disposal or incineration.  
 Send to a licensed waste management company.

The product should not be allowed to enter drains, water courses or the soil.

Do not contaminate ponds, waterways or ditches with chemical or used container.

Send to a licensed waste management company.

Dispose of as hazardous waste in compliance with local and national regulations.

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

Contaminated packaging : Empty remaining contents.

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Dispose of as unused product.  
Do not re-use empty containers.

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

**SECTION 14. TRANSPORT INFORMATION****International Regulations****IATA**

UN/ID No. : UN 3082  
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.  
(BISPHENOL A EPOXY RESIN)  
Class : 9  
Packing group : III  
Labels : Miscellaneous  
Packing instruction (cargo aircraft) : 964  
Packing instruction (passenger aircraft) : 964  
Environmentally hazardous : yes

**IMDG**

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

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

Not applicable for product as supplied.

**National Regulations****DOT Classification**

UN/ID/NA number : UN 3082  
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,  
N.O.S.  
(BISPHENOL A EPOXY RESIN)  
Class : 9  
Packing group : III  
Labels : CLASS 9  
ERG Code : 171



**ARALDITE® 2031-1 RESIN**

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Marine pollutant : yes(BISPHENOL A EPOXY RESIN)  
 Remarks : Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

**Special precautions for user**

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

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

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

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

**California Prop. 65**

This product contains a chemical that is at or below California Propositions 65's "safe harbor level" as determined via a risk assessment. Therefore, the chemical is not required to be listed as a Prop 65 chemical on the SDS or label.

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

CH INV : The formulation contains substances listed on the Swiss Inventory

DSL : All components of this product are on the Canadian DSL

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

NZIoC : Not 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

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

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

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**Inventories**

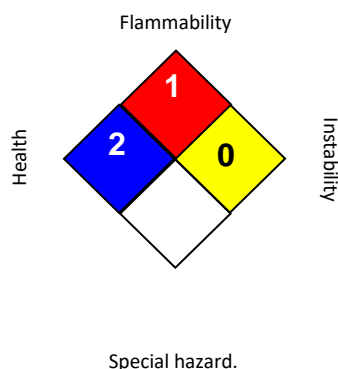
AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

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

No substances are subject to a Significant New Use Rule.

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

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

**SECTION 16. OTHER INFORMATION****Further information****NFPA 704:****HMIS® IV:**

|                        |  |          |
|------------------------|--|----------|
| <b>HEALTH</b>          |  | <b>2</b> |
| <b>FLAMMABILITY</b>    |  | <b>1</b> |
| <b>PHYSICAL HAZARD</b> |  | <b>0</b> |

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 : 05/15/2019

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

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

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

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

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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.



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**ARALDITE® 2031-1 HARDENER**

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**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2031-1 HARDENER

**Manufacturer or supplier's details**

Company name of supplier : Huntsman Advanced Materials Americas LLC  
Address : P.O. Box 4980

The Woodlands,  
TX 77387  
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address of person responsible for the SDS : MSDS@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

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

Recommended use : Hardener

**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with 29 CFR 1910.1200**

Skin corrosion : Category 1B

Serious eye damage : Category 1

Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 3

Long-term (chronic) aquatic hazard : Category 2

**GHS label elements**

Hazard pictograms :



Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.  
H317 May cause an allergic skin reaction.  
H402 Harmful to aquatic life.  
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**

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P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
 P264 Wash skin thoroughly after handling.  
 P272 Contaminated work clothing must not be allowed out of the workplace.  
 P273 Avoid release to the environment.  
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.  
 P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
 P363 Wash contaminated clothing before reuse.  
 P391 Collect spillage.

**Storage:**

P405 Store locked up.

**Disposal:**

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

**Other hazards**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Hazardous components**

| Chemical name  | CAS-No.    | Concentration (% w/w) |
|--|------------|-----------------------|
| barium sulfate   | 7727-43-7  | 30 - 50               |
| 2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated | 68683-29-4 | 30 - 50               |
| 1,3-Cyclohexanedimethanamine   | 2579-20-6  | 10 - 20               |
| bis(isopropyl)naphthalene  | 38640-62-9 | 5 - 10                |
| 2,4,6-tris(dimethylaminomethyl)phenol  | 90-72-2    | 1 - 2.5               |

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

**SECTION 4. FIRST AID MEASURES**

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- General advice : Move out of dangerous area.  
Consult a physician.  
Show this safety data sheet to the doctor in attendance.  
Treat symptomatically.  
Get medical attention if symptoms occur.
- If inhaled : If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.
- In case of skin contact : 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.  
Keep eye wide open while rinsing.  
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.  
Do NOT induce vomiting.  
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.

**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 : No hazardous combustion products are known
- Specific extinguishing methods : No data is available on the product itself.

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- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Refer to protective measures listed in sections 7 and 8.
- 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**

- Technical measures : Ensure that eyewash stations and safety showers are close to the workstation location.
- Local/Total ventilation : Ensure adequate ventilation.
- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Do not breathe vapours or spray mist.  
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.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Observe label precautions.  
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this

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Recommended storage temperature : 36 - 104 °F / 2 - 40 °C  
Further information on storage stability : Stable under normal conditions.

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

| Components     | CAS-No.   | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis    |
|----------------|-----------|-------------------------------|--|----------|
| barium sulfate | 7727-43-7 | TWA (total dust)              | 15 mg/m <sup>3</sup>                           | OSHA Z-1 |
|                |           | TWA (respirable fraction)     | 5 mg/m <sup>3</sup>                            | OSHA Z-1 |
|                |           | TWA (Inhalable fraction)      | 5 mg/m <sup>3</sup>                            | ACGIH    |

**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

Respiratory protection : No personal respiratory protective equipment normally required.

**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).  
The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water



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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 : paste

Colour : black

Odour : very faint, amine-like

Odour Threshold : No data is available on the product itself.

pH : No data is available on the product itself.

Freezing point : No data is available on the product itself.

Melting point : No data is available on the product itself.

Boiling point : > 392 °F / > 200 °C  
Method: estimated

Flash point : > 212 °F / > 100 °C  
Method: estimated, closed cup

Evaporation rate : No data is available on the product itself.

Flammability (solid, gas) : No data is available on the product itself.

Flammability (liquids) : No data is available on the product itself.

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

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

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

Density : ca. 1.4 g/cm<sup>3</sup> (73 °F / 23 °C)

Solubility(ies)

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Water solubility : insoluble

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 : > 392 °F / > 200 °C  
Method: estimated

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

Viscosity  
Viscosity, dynamic : 125 - 225 Pas (68 °F / 20 °C)

Explosive properties : No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

Particle size : No data is available on the product itself.

**SECTION 10. STABILITY AND REACTIVITY**

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

Chemical stability : Stable under normal conditions.

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

Conditions to avoid : None known.

Incompatible materials : Strong acids and strong bases  
Strong oxidizing agents

Hazardous decomposition products : No hazardous decomposition products are known.

**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 : 2,681 mg/kg  
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate: 55.8 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Calculation method

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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:**

Assessment: Causes burns.

Remarks: Information given is based on data obtained from similar substances.

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

barium sulfate:

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: slight irritation

Assessment: Mild eye irritant

bis(isopropyl)naphthalene:

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: Corrosive

Assessment: Corrosive

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

barium sulfate:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: Does not cause skin sensitisation.

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.

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1,3-Cyclohexanedimethanamine:  
 Exposure routes: Skin  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: Does not cause skin sensitisation.

bis(isopropyl)naphthalene:  
 Test Type: Maximisation Test  
 Exposure routes: Skin  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: Does not cause skin sensitisation.

2,4,6-tris(dimethylaminomethyl)phenol:  
 Exposure routes: Skin  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: Does not cause skin sensitisation.

**Components:**

bis(isopropyl)naphthalene:  
 Assessment: May be harmful if swallowed or if inhaled.  
 Does not cause skin sensitisation.

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

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

1,3-Cyclohexanedimethanamine:  
 Genotoxicity in vitro : 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 471  
 Result: negative

bis(isopropyl)naphthalene:  
 Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro  
 Test system: Chinese hamster ovary cells  
 Concentration: 9.5 - 60 µg/L  
 Metabolic activation: with and without metabolic activation

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Method: OECD Test Guideline 473  
Result: negative

Test Type: Ames test  
Test system: Salmonella typhimurium  
Concentration: 92 mg/plate  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Test system: mouse lymphoma cells  
Concentration: 40 - 60 mg/ml  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
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

**Components:****1,3-Cyclohexanedimethanamine:**

Genotoxicity in vivo : Application Route: Oral  
Method: OECD Test Guideline 474  
Result: negative

**bis(isopropyl)naphthalene:**

Genotoxicity in vivo : Test Type: Micronucleus test  
Species: Mouse (male and female)  
Application Route: Intraperitoneal injection  
Dose: 1.92 g/kg  
Method: OECD Test Guideline 474  
Result: negative

**Components:****bis(isopropyl)naphthalene:**

Germ cell mutagenicity-  
Assessment : Tests on bacterial or mammalian cell cultures did not show  
mutagenic effects.

Germ cell mutagenicity-  
Assessment : No data available

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**Carcinogenicity****Components:**

barium sulfate:

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

**IARC**

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**ACGIH**

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

**OSHA**

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP**

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

**Reproductive toxicity****Components:**

1,3-Cyclohexanedimethanamine:

Effects on fertility

: Species: Rat, male and female

Application Route: Oral

Method: OECD Test Guideline 422

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

**Components:**

bis(isopropyl)naphthalene:

Effects on foetal development

: Species: Rat, female

Application Route: Oral

Dose: 100, 250, 625 mg/kg

Duration of Single Treatment: 20 d

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Frequency of Treatment: 7 days/week  
General Toxicity Maternal: Lowest observed adverse effect level: 250 mg/kg body weight  
Teratogenicity: No observed adverse effect level: 625 mg/kg body weight  
Embryo-foetal toxicity: No observed adverse effect level: 625 mg/kg body weight  
Method: Directive 67/548/EEC, Annex V, B.31.  
Result: No teratogenic effects

**Components:**

bis(isopropyl)naphthalene:  
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:**

barium sulfate:  
Species: Rat  
LOEC:  $\geq$  104 mg/kg, 40 mg/m<sup>3</sup>  
Application Route: Ingestion  
Test atmosphere: dust/mist  
Exposure time: 5 h  
Number of exposures: 5 d  
Method: Subchronic toxicity

1,3-Cyclohexanedimethanamine:

Species: Rat, male  
NOAEL: 60 mg/kg/d  
Application Route: Ingestion  
Exposure time: 1,008 h  
Number of exposures: 7 d  
Method: Subacute toxicity

bis(isopropyl)naphthalene:

Species: Rat, male and female  
NOAEL: 170 mg/kg  
Application Route: oral (feed)  
Exposure time: 4,320 h  
Number of exposures: 7 d  
Dose: 170, 340, and 670 mg/kg  
Method: Subchronic toxicity  
Remarks: No significant adverse effects were reported

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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

**Components:**

bis(isopropyl)naphthalene:  
Repeated dose toxicity - Assessment : May be harmful if swallowed or if inhaled.  
No adverse effect has been observed in chronic toxicity tests.

**Aspiration toxicity****Components:**

bis(isopropyl)naphthalene:  
May be fatal if swallowed and enters airways.

**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



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

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

1,3-Cyclohexanedimethanamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 130 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

bis(isopropyl)naphthalene:

Toxicity to fish : LC50: > 0.5 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Method: Directive 67/548/EEC, Annex V, C.1.  
Remarks: No toxicity at the limit of solubility

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

**Components:**

barium sulfate:

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 14.5 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

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

1,3-Cyclohexanedimethanamine:

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 33.1 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

bis(isopropyl)naphthalene:

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): > 0.16 mg/l

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aquatic invertebrates

Exposure time: 48 h  
Test Type: static test  
Method: OECD Test Guideline 202  
Remarks: No toxicity at the limit of solubility

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

2,4,6-tris(dimethylaminomethyl)phenol:  
Toxicity to daphnia and other aquatic invertebrates : LC50: 718 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Marine water

**Components:**

barium sulfate:  
Toxicity to algae : EC50: > 100 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

NOEC: > 1.15 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated:  
Toxicity to algae : EC50 (No information available.): > 1,000 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

1,3-Cyclohexanedimethanamine:  
Toxicity to algae : EbC50 (Selenastrum capricornutum (green algae)): 29.7 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

bis(isopropyl)naphthalene:  
Toxicity to algae : NOECr (Desmodesmus subspicatus (green algae)): ca. 0.15 mg/l  
Exposure time: 72 h  
Test Type: static test  
Method: DIN 38412  
GLP: no  
Remarks: Aquatic toxicity is unlikely due to low solubility.

2,4,6-tris(dimethylaminomethyl)phenol:  
Toxicity to algae : ErC50 (Desmodesmus subspicatus (green algae)): 84 mg/l  
Exposure time: 72 h

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Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 6.25 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 201

**Components:**

bis(isopropyl)naphthalene:  
 M-Factor (Acute aquatic toxicity) : 1  
 Toxicity to fish (Chronic toxicity) : No data available

**Components:**

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

bis(isopropyl)naphthalene:  
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.013 mg/l  
 Exposure time: 21 d  
 Test Type: semi-static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 202

**Components:**

bis(isopropyl)naphthalene:  
 M-Factor (Chronic aquatic toxicity) : 1

**Components:**

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

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

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## Ecotoxicology Assessment

**Components:**

1,3-Cyclohexanedimethanamine:

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

bis(isopropyl)naphthalene:

Acute aquatic toxicity : No toxicity at the limit of solubility

**Components:**

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

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

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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

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

Biodegradability : Result: Not readily biodegradable.

1,3-Cyclohexanedimethanamine:

Biodegradability : Inoculum: activated sludge  
Concentration: 10 mg/l  
Result: Not readily biodegradable.  
Biodegradation: 29 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

bis(isopropyl)naphthalene:

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

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

Biodegradability : Inoculum: activated sludge  
Concentration: 2 mg/l  
Result: Not biodegradable  
Biodegradation: 4 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand : No data available

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(COD)

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

**Components:**

1,3-Cyclohexanedimethanamine:

Stability in water : Degradation half life(DT50): > 1 yr (77 °F / 25 °C) pH: 6.5  
Method: OECD Test Guideline 111  
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

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

bis(isopropyl)naphthalene:

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

1,3-Cyclohexanedimethanamine:

Partition coefficient: n-octanol/water : log Pow: 0.783 (70.7 °F / 21.5 °C)  
Method: OECD Test Guideline 107

bis(isopropyl)naphthalene:

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

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

Partition coefficient: n-octanol/water : log Pow: 0.219 (70.7 °F / 21.5 °C)  
Method: OPPTS 830.7550**Mobility in soil**

Mobility : No data available

**Components:**

bis(isopropyl)naphthalene:

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Distribution among environmental compartments : Koc: 36108  
Method: QSAR

Stability in soil : No data available

**Other adverse effects**

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

**Hazardous to the ozone layer**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82  
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances  
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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

Global warming potential (GWP) : No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

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

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

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**SECTION 14. TRANSPORT INFORMATION****International Regulations****IATA**

|   |  |
|---|--|
| UN/ID No.                                   | : UN 2735  |
| Proper shipping name                        | : Polyamines, liquid, corrosive, n.o.s.<br>(1,3-CYCLOHEXANEDIMETHANAMINE,<br>DIISOPROPYLNAPHTHALENE ISOMERS) |
| Class                                       | : 8  |
| Packing group                               | : II   |
| Labels                                      | : Corrosive  |
| Packing instruction (cargo<br>aircraft)     | : 855  |
| Packing instruction<br>(passenger aircraft) | : 851  |

**IMDG**

|                      |  |
|----------------------|--|
| UN number            | : UN 2735  |
| Proper shipping name | : POLYAMINES, LIQUID, CORROSIVE, N.O.S.<br>(1,3-CYCLOHEXANEDIMETHANAMINE,<br>DIISOPROPYLNAPHTHALENE ISOMERS) |
| Class                | : 8  |
| Packing group        | : II   |
| Labels               | : 8  |
| EmS Code             | : F-A, S-B   |
| Marine pollutant     | : yes  |

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

Not applicable for product as supplied.

**National Regulations****DOT Classification**

|                      |  |
|----------------------|--|
| UN/ID/NA number      | : UN 2735  |
| Proper shipping name | : POLYAMINES, LIQUID, CORROSIVE, N.O.S.<br>(1,3-CYCLOHEXANEDIMETHANAMINE,<br>DIISOPROPYLNAPHTHALENE ISOMERS) |
| Class                | : 8  |
| Packing group        | : II   |
| Labels               | : CORROSIVE  |
| ERG Code             | : 153  |
| Marine pollutant     | : yes(DIISOPROPYLNAPHTHALENE ISOMERS)  |

**Special precautions for user**

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

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

| Components | CAS-No.   | Component RQ<br>(lbs) | Calculated product RQ<br>(lbs) |
|------------|-----------|-----------------------|--------------------------------|
| arsenic    | 7440-38-2 | 1                     | *                              |
| lead       | 7439-92-1 | 10                    | *                              |
| Cadmium    | 7440-43-9 | 10                    | *                              |
| beryllium  | 7440-41-7 | 10                    | *                              |
| chromium   | 7440-47-3 | 5000                  | *                              |

\*: Calculated RQ exceeds reasonably attainable upper limit.

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

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

**California Prop. 65**

WARNING: This product can expose you to chemicals including lead, arsenic, Cadmium, beryllium, which is/are known to the State of California to cause cancer, and lead, Cadmium, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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

|        |  |
|--------|--|
| CH INV | : The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory |
| DSL    | : All components of this product are on the Canadian DSL   |
| AICS   | : On the inventory, or in compliance with the inventory  |
| NZIoC  | : Not 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  |
| 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), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

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

No substances are subject to a Significant New Use Rule.

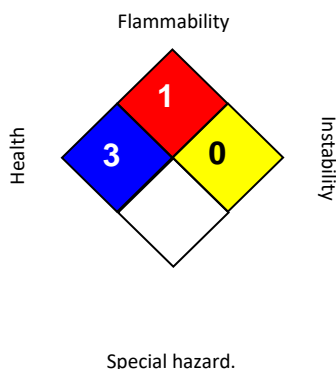


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**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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

**SECTION 16. OTHER INFORMATION****Further information****NFPA 704:****HMIS® IV:**

|                        |  |          |
|------------------------|--|----------|
| <b>HEALTH</b>          |  | <b>3</b> |
| <b>FLAMMABILITY</b>    |  | <b>1</b> |
| <b>PHYSICAL HAZARD</b> |  | <b>0</b> |

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.

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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

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

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

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

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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