

**ARALDITE® 2019 A**

Version 1.1      Revision Date: 05/27/2020      SDS Number: 400001011815      Date of last issue: 04/03/2020  
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**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2019 A

**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 : Global\_Product\_EHS\_AdMat@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

Chronic aquatic toxicity : 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:**  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

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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	50 - 70
Glass, oxide, chemicals	65997-17-3	1 - 5
4,4'-isopropylidenebis[2-allylphenol]	1745-89-7	0.25 - 1

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.

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Get medical attention if symptoms occur.

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

**SECTION 5. FIREFIGHTING MEASURES**

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

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

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

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- Environmental precautions : Prevent product from entering drains.  
Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).  
Keep in suitable, closed containers for disposal.

**SECTION 7. HANDLING AND STORAGE**

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Do not breathe vapours 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.  
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**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Glass, oxide, chemicals	65997-17-3	TWA (fibres)	1 fibres per cubic centimeter	ACGIH
		TWA (Inhalable particulate matter)	5 mg/m <sup>3</sup>	ACGIH

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		TWA (fibres)	1 fibres per cubic centimeter	ACGIH
		TWA (fibres)	1 fibres per cubic centimeter	ACGIH

**Personal protective equipment**

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any 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  
 Break through time : > 8 h

Material : Solvent-resistant gloves (butyl-rubber)  
 Material : Nitrile rubber  
 Material : Neoprene gloves  
 Material : PVC

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

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

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

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

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

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

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Freezing point	:	No data is available on the product itself.
Melting point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	> 212 °F / > 100 °C Method: Information given is based on data obtained from similar substances., 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	:	1.2 g/cm <sup>3</sup> (68 °F / 20 °C) Method: DIN 51757
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	:	> 284 °F / > 140 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	130,000 mPa.s (77 °F / 25 °C) Method: ISO 3219 thixotropic
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.

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

**SECTION 10. STABILITY AND REACTIVITY**

Reactivity : No dangerous reaction known under conditions of normal use.  
Chemical stability : Stable under normal conditions.  
Possibility of hazardous reactions : No hazards to be specially mentioned.  
Conditions to avoid : None known.  
Incompatible materials : None known.  
Hazardous decomposition products : carbon dioxide  
carbon monoxide  
Halogenated compounds

**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  
Remarks: No mortality observed at this dose.

4,4'-isopropylidenebis[2-allylphenol]:

Acute oral toxicityComponents : LD50 (Rat, male and female): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
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

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

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

Species: Rabbit

Exposure time: 4 h

Assessment: Irritating to skin.

Method: OECD Test Guideline 404

Result: Irritating to skin.

Glass, oxide, chemicals:

Species: Rabbit

Assessment: No skin irritation

Method: OECD Test Guideline 404

Result: Normally reversible injuries

4,4'-isopropylidenebis[2-allylphenol]:

Species: Rabbit

Exposure time: 4 h

Method: OECD Test Guideline 404

Result: Causes burns.

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

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

Species: Rabbit

Result: Irritating to eyes.

Assessment: Irritating to eyes.

Method: OECD Test Guideline 405

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

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

Test Type: Local lymph node assay (LLNA)

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

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

Glass, oxide, chemicals:

Exposure routes: Skin

Species: Other

Result: Does not cause skin sensitisation.

4,4'-isopropylidenebis[2-allylphenol]:

Exposure routes: Skin contact

Species: Mouse

Method: OECD Test Guideline 429

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

Assessment: No data available



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

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

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Test system: mouse lymphoma cells  
Metabolic activation: without metabolic activation  
Result: positive

Test Type: reverse mutation assay  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)  
Result: negative

4,4'-isopropylidenebis[2-allylphenol]:

Genotoxicity in vitro : Test Type: reverse mutation assay  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)  
Result: negative

Test Type: reverse mutation assay  
Test system: Escherichia coli  
Method: Mutagenicity (Escherichia coli - reverse mutation assay)  
Result: negative

Test Type: Chromosome aberration test in vitro  
Test system: Chinese hamster ovary cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Test system: Chinese hamster ovary cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

**Components:**

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

Genotoxicity in vivo : Test Type: in vivo assay  
Species: Mouse (male)  
Cell type: Germ  
Application Route: Oral  
Dose: 3333, 10000 mg/kg  
Result: negative

Test Type: gene mutation test  
Species: Rat (male)  
Cell type: Somatic  
Application Route: Oral  
Dose: 50,250,500,1000 mg/kg bw/day

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Method: OECD Test Guideline 488  
Result: negative

Germ cell mutagenicity- Assessment : No data available

**Carcinogenicity****Components:**

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

Species: Rat, male

Application Route: Oral

Exposure time: 24 month(s)

Dose: 0, 2, 15, or 100 mg/kg bw/day

Frequency of Treatment: 7 days/week

NOAEL: 15 mg/kg bw/day

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

Species: Mouse, male

Application Route: Dermal

Exposure time: 24 month(s)

Dose: 0, 0.1, 10, 100 mg/kg bw/day

Frequency of Treatment: 3 days/week

NOEL: 0.1 mg/kg body weight

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

Species: Rat, female

Application Route: Dermal

Exposure time: 24 month(s)

Dose: 0.1, 100, 1000 mg/kg bw/day

Frequency of Treatment: 5 days/week

NOEL: 100 mg/kg body weight

Method: OECD Test Guideline 453

Result: negative

Species: Rat, female

Application Route: Oral

Exposure time: 24 month(s)

Dose: 0, 2, 15, or 100 mg/kg bw/day

Frequency of Treatment: 7 days/week

NOAEL: 100 mg/kg bw/day

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

Species: Rat, females

Application Route: Oral

Exposure time: 24 month(s)

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Dose: 0, 2, 15, or 100 mg/kg bw/day  
Frequency of Treatment: 7 days/week  
NOEL: 2 mg/kg bw/day

Method: OECD Test Guideline 453  
Result: negative  
Target Organs: Digestive organs

Carcinogenicity - Assessment : No data available

**IARC**  
Group 2A: Probably carcinogenic to humans  
Glass, oxide, chemicals  
(glass)  
Group 2B: Possibly carcinogenic to humans  
Glass, oxide, chemicals  
(special-purpose fibres)

**ACGIH**  
Confirmed animal carcinogen with unknown relevance to humans  
  
Glass, oxide, chemicals

**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: 0, 50, 180, 540 or 750 milligram per kilogram  
Duration of Single Treatment: 238 d  
Frequency of Treatment: 1 daily  
General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight  
General Toxicity F1: No-observed-effect level: 750 mg/kg body weight  
Symptoms: No adverse effects  
Method: OECD Test Guideline 416  
Result: No effects on fertility and early embryonic development were detected.

4,4'-isopropylidenebis[2-allylphenol]:

Species: Rat, male and female  
Application Route: Oral  
Dose: 85/250/750/500 milligram per kilogram  
Frequency of Treatment: 7 days/week  
General Toxicity - Parent: No-observed-effect level: 250

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mg/kg body weight  
 Method: OECD Test Guideline 422  
 Result: Not classified

**Components:**

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

Effects on foetal development : Species: Rabbit, female  
 Application Route: Dermal  
 Dose: 0, 30, 100 or 300 milligram per kilogram  
 Duration of Single Treatment: 28 d  
 Frequency of Treatment: 1 daily  
 General Toxicity Maternal: No observed adverse effect level:  
 30 mg/kg body weight  
 Developmental Toxicity: No observed adverse effect level:  
 300 mg/kg body weight  
 Method: Other guidelines  
 Result: No teratogenic effects

Test Type: Pre-natal  
 Species: Rabbit, female  
 Application Route: Oral  
 Dose: 0, 20, 60 or 180 milligram per kilogram  
 Duration of Single Treatment: 13 d  
 Frequency of Treatment: 1 daily  
 General Toxicity Maternal: No observed adverse effect level:  
 60 mg/kg body weight  
 Developmental Toxicity: No observed adverse effect level:  
 180 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No teratogenic effects

Test Type: Pre-natal  
 Species: Rat, female  
 Application Route: Oral  
 Dose: 0, 60, 180 and 540 milligram per kilogram  
 Duration of Single Treatment: 10 d  
 Frequency of Treatment: 1 daily  
 General Toxicity Maternal: No observed adverse effect level:  
 180 mg/kg body weight  
 Developmental Toxicity: No observed adverse effect level: >  
 540 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No teratogenic effects

4,4'-isopropylidenebis[2-allylphenol]:

Species: Rat, male and female  
 Application Route: Oral  
 Dose: 85/250/750/500 milligram per kilogram  
 Frequency of Treatment: 7 days/week  
 Developmental Toxicity: No observed adverse effect level:  
 500 mg/kg body weight  
 Method: OECD Test Guideline 422  
 Result: No adverse effects

Reproductive toxicity - Assessment : No data available

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**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: oral (gavage)

Exposure time: 14 Weeks

Number of exposures: 7 d

Dose: 0, 50, 250, 1000 mg/kg/day

Method: OECD Test Guideline 408

Species: Rat, male and female

NOAEL:  $\geq$  10 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 5 d

Dose: 0, 10, 100, 1000 mg/kg/day

Method: OECD Test Guideline 411

Species: Mouse, male

NOAEL: 100 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 3 d

Dose: 0, 1, 10, 100 mg/kg/day

Method: OECD Test Guideline 411

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

4,4'-isopropylidenebis[2-allylphenol]:

Species: Rat, male and female

NOAEL: 85 mg/kg

NOAEL: 85 mg/kg

Application Route: Oral

Exposure time: 8 week

Number of exposures: 7 d/week

Dose: 85/250/700/500

Method: OECD Test Guideline 422

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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****Ecotoxicity****Components:**

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

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l  
Exposure time: 96 h  
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

4,4'-isopropylidenebis[2-allylphenol]:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.21 mg/l

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Exposure time: 96 h  
Test Type: semi-static test  
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)): 1.8 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

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

4,4'-isopropylidenebis[2-allylphenol]:  
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.64 mg/l  
Exposure time: 48 h  
Test Type: semi-static test  
Method: OECD Test Guideline 202

**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:  
Toxicity to algae/aquatic plants : EC50: 11 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: EPA-660/3-75-009

NOEC: 4.2 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

4,4'-isopropylidenebis[2-allylphenol]:  
Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): 1.4 mg/l  
Exposure time: 72 h  
Test Type: static test  
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (algae)): 0.11 mg/l  
Exposure time: 72 h  
Test Type: static test

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Method: OECD Test Guideline 201

**Components:**

4,4'-isopropylidenebis[2-allylphenol]:

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : No data available

**Components:**

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.3 mg/l  
Exposure time: 21 d  
Test Type: semi-static test

Test substance: Fresh water

Method: OECD Test Guideline 211

**Components:**

4,4'-isopropylidenebis[2-allylphenol]:

M-Factor (Chronic aquatic toxicity) :

1

**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

4,4'-isopropylidenebis[2-allylphenol]:

Toxicity to microorganisms : EC50 (activated sludge): 310 mg/l  
End point: Growth rate  
Exposure time: 3 h  
Test Type: Respiration inhibition  
Method: OECD Test Guideline 209

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment  
Acute aquatic toxicity : No data available**Components:**

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



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

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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

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

Biodegradability : Test Type: aerobic  
 Inoculum: activated sludge, non-adapted  
 Concentration: 20 mg/l  
 Result: Not readily biodegradable.  
 Biodegradation: 5 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301F

4,4'-isopropylidenebis[2-allylphenol]:

Biodegradability : Test Type: aerobic  
 Inoculum: Mixture  
 Concentration: 30 mg/l  
 Result: Not inherently biodegradable.  
 Biodegradation: 0 %  
 Exposure time: 28 d  
 Method: Inherent Biodegradability: Modified MITI Test (II)

Test Type: aerobic  
 Inoculum: activated sludge  
 Concentration: 30 mg/l  
 Result: Not readily biodegradable.  
 Biodegradation: 0 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301B

**Components:**

4,4'-isopropylidenebis[2-allylphenol]:

Biochemical Oxygen Demand (BOD) : Biochemical oxygen demand  
 54,82 mg O<sub>2</sub>/L  
 Concentration: 30 mg/l  
 Method: OECD Test Guideline 302C

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

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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

4,4'-isopropylidenebis[2-allylphenol]:

Stability in water : Degradation half life(DT50): > 1 yr (77 °F / 25 °C) pH: 4  
Method: OECD Test Guideline 111

Degradation half life(DT50): > 1 yr (77 °F / 25 °C) pH: 7  
Method: OECD Test Guideline 111

Degradation half life(DT50): 249 d (77 °F / 25 °C) pH: 9  
Method: OECD Test Guideline 111

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

4,4'-isopropylidenebis[2-allylphenol]:

Partition coefficient: n-octanol/water : Pow: 13,200 (68 °F / 20 °C)  
log Pow: 4.12 (68 °F / 20 °C)  
Method: OECD Test Guideline 117

**Mobility in soil**

Mobility : No data available

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**Components:**

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

Distribution among : Koc: 445  
environmental compartments

4,4'-isopropylidenebis[2-allylphenol]:

Distribution among : Adsorption/Soil  
environmental compartments Koc: 4990, log Koc: 3.7  
Method: OECD Test Guideline 121

Stability in soil : No data available

**Other adverse effects**

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

**Hazardous to the ozone layer**Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82  
Protection of Stratospheric Ozone - CAA Section 602 Class I  
Substances  
Remarks: This product neither contains, nor was  
manufactured with a Class I or Class II ODS as defined by the  
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +  
B).Additional ecological information - Product : An environmental hazard cannot be excluded in the event of  
unprofessional handling or disposal.  
Toxic to aquatic life with long lasting effects.

Global warming potential (GWP) : No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**Waste from residues : The product should not be allowed to enter drains, water  
courses or the soil.  
Do not contaminate ponds, waterways or ditches with  
chemical or used container.  
Send to a licensed waste management company.  
Dispose of as hazardous waste in compliance with local and  
national regulations.  
Dispose of contents/ container to an approved waste disposal  
plant.

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

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

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

**IMDG**

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

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

Not applicable for product as supplied.

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

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

**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

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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**

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

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

CH INV	: The formulation contains substances listed on the Swiss Inventory
DSL	: This product contains one or several components listed in the Canadian NDSL.
AICS	: Not in compliance with the inventory
NZIoC	: Not in compliance with the inventory
ENCS	: Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
KECI	: On the inventory, or in compliance with the inventory
PICCS	: Not in compliance with the inventory
IECSC	: Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
TCSI	: On the inventory, or in compliance with the inventory
TSCA	: On the inventory, or in compliance with the inventory

**Inventories**

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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**

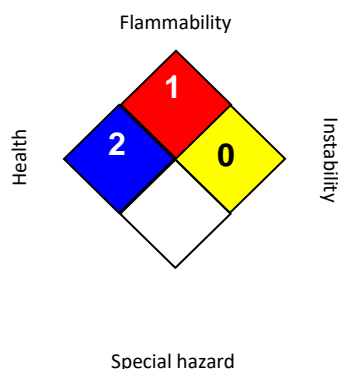
This product is subject under TSCA 5(a) to Significant New Use Restrictions (SNUR).

Benzaldehyde, 2-hydroxy-, polymer with (chloromethyl)oxirane and phenol      ACCN # 126002      See 40 CFR § 721.7210

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

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

Benzaldehyde, 2-hydroxy-, polymer with (chloromethyl)oxirane and phenol      ACCN # 126002

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

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

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "\*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

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ACGIH : USA. ACGIH Threshold Limit Values (TLV)  
 ACGIH / 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.

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

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

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[chemical-concepts.com](http://chemical-concepts.com)**800.220.1966**

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**SECTION 1. IDENTIFICATION**

Product name : ARALDITE® 2019 B

**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 : Global\_Product\_EHS\_AdMat@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  
Reproductive toxicity : Category 2  
Specific target organ toxicity - repeated exposure (Inhalation) : Category 1 (Respiratory Tract)

**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.  
H361 Suspected of damaging fertility or the unborn child.  
H372 Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.



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Precautionary statements : **Prevention:**  
 P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.  
 P264 Wash skin thoroughly after handling.  
 P270 Do not eat, drink or smoke when using this product.  
 P272 Contaminated work clothing must not be allowed out of the workplace.  
 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.  
 P308 + P313 IF exposed or concerned: Get medical advice/ attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
 P363 Wash contaminated clothing before reuse.  
**Storage:**  
 P405 Store locked up.  
**Disposal:**  
 P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

**Other hazards**

None known.

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

Substance / Mixture : Mixture

Chemical nature : Amines

**Hazardous components**

Chemical name	CAS-No.	Concentration (% w/w)
4,7,10-trioxatridecane-1,13-diamine	4246-51-9	30 - 50
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperaziny)ethyl]amino]butyl-terminated	68683-29-4	20 - 30
4-methylcyclohexane-1,3-diamine	13897-55-7	10 - 20
2-methylcyclohexane-1,3-diamine	13897-56-8	3 - 5
2-piperazin-1-ylethylamine	140-31-8	1 - 2.5

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

**SECTION 4. FIRST AID MEASURES**

- General advice : Move out of dangerous area.  
Consult a physician.  
Show this safety data sheet to the doctor in attendance.  
Treat symptomatically.  
Get medical attention if symptoms occur.
- If inhaled : Consult a physician after significant exposure.  
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 : High volume water jet

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- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide  
Nitrogen oxides (NO<sub>x</sub>)
- Specific extinguishing methods : No data is available on the product itself.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Ensure adequate ventilation.  
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 : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.  
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.  
Avoid contact with skin and eyes.  
For personal protection see section 8.

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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.

- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Observe label precautions.  
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
- Filter type : Filter type A-P
- Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
- 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  
Tightly fitting safety goggles

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Wear face-shield and protective suit for abnormal processing problems.

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

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

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	: liquid
Colour	: yellow
Odour	: amine-like
Odour Threshold	: No data is available on the product itself.
pH	: No data is available on the product itself.
Freezing point	: No data is available on the product itself.
Melting point	: No data is available on the product itself.
Boiling point	: > 212 °F / > 100 °C
Flash point	: > 212 °F / > 100 °C Method: closed cup
Evaporation rate	: No data is available on the product itself.
Flammability (solid, gas)	: No data is available on the product itself.
Flammability (liquids)	: No data is available on the product itself.
Upper explosion limit / Upper flammability limit	: No data is available on the product itself.
Lower explosion limit / Lower flammability limit	: No data is available on the product itself.
Vapour pressure	: No data is available on the product itself.
Relative vapour density	: No data is available on the product itself.
Relative density	: 1 (73 °F / 23 °C)
Density	: No data is available on the product itself.
Solubility(ies) Water solubility	: No data is available on the product itself.

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Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Auto-ignition temperature : No data is available on the product itself.

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

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

Viscosity  
Viscosity, dynamic : 10 Pas (68 °F / 20 °C)  
thixotropic

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

**SECTION 11. TOXICOLOGICAL INFORMATION**

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

**Acute toxicity**

Acute oral toxicity - Product : Acute toxicity estimate : 3,392 mg/kg  
Method: Calculation method

Acute inhalation toxicity : No data available

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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****Components:**

4,7,10-trioxatridecane-1,13-diamine:

Species: Rabbit

Method: Other guidelines

Result: Corrosive after 3 minutes to 1 hour of exposure

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.

4-methylcyclohexane-1,3-diamine:

Species: human skin

Method: OECD Test Guideline 435

Result: Causes burns.

2-methylcyclohexane-1,3-diamine:

Species: human skin

Method: OECD Test Guideline 435

Result: Causes burns.

2-piperazin-1-ylethylamine:

Species: Rabbit

Result: Causes burns.

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

4,7,10-trioxatridecane-1,13-diamine:

Species: Rabbit

Result: Risk of serious damage to eyes.

Assessment: Risk of serious damage to eyes.

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

4-methylcyclohexane-1,3-diamine:

Result: Corrosive

2-piperazin-1-ylethylamine:

Species: Rabbit

Result: Risk of serious damage to eyes.

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

4,7,10-trioxatridecane-1,13-diamine:

Exposure routes: Skin

Species: Other

Result: May cause sensitisation by skin contact.

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.

4-methylcyclohexane-1,3-diamine:

Exposure routes: Skin

Result: Substance is not considered to be potential skin sensitiser.

2-methylcyclohexane-1,3-diamine:

Exposure routes: Skin

Result: Substance is not considered to be potential skin sensitiser.

2-piperazin-1-ylethylamine:

Exposure routes: Skin

Species: Guinea pig

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

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

**Components:**

4,7,10-trioxatridecane-1,13-diamine:

Assessment: May be harmful if swallowed or in contact with skin., Causes severe skin burns and eye damage.  
May cause an allergic skin reaction.

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

4,7,10-trioxatridecane-1,13-diamine:

Genotoxicity in vitro

: Test Type: Ames test

Test system: Salmonella typhimurium

Concentration: 5000 ug/plate

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: Micronucleus test

Test system: Chinese hamster fibroblasts

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 487

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster ovary cells



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

2-piperazin-1-ylethylamine:  
 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

**Components:**

2-piperazin-1-ylethylamine:  
 Genotoxicity in vivo

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

**Components:**

4,7,10-trioxatridecane-1,13-diamine:  
 Germ cell mutagenicity-  
 Assessment

: In vitro tests did not show mutagenic effects

**Carcinogenicity**

No data available

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:**

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**4,7,10-trioxatridecane-1,13-diamine:**

Effects on fertility : Species: Rat, male and female  
Application Route: Oral  
Dose: 100,300,1000 (600 day7) mg/kg  
Frequency of Treatment: 7 days/week  
General Toxicity - Parent: No observed adverse effect level:  
600 mg/kg body weight  
Fertility: No observed adverse effect level: 600 mg/kg body  
weight  
Early Embryonic Development: No observed adverse effect  
level: 600 mg/kg body weight  
Method: OECD Test Guideline 422

**4-methylcyclohexane-1,3-diamine:**

Application Route: Oral  
Method: OECD Test Guideline 422

**2-methylcyclohexane-1,3-diamine:**

Application Route: Oral  
Method: OECD Test Guideline 422

**Components:****4-methylcyclohexane-1,3-diamine:**

Effects on foetal development : Application Route: Oral  
Method: OECD Test Guideline 422  
Result: No teratogenic effects

**2-methylcyclohexane-1,3-diamine:**

Application Route: Oral  
Method: OECD Test Guideline 422  
Result: No teratogenic effects

**Components:****4,7,10-trioxatridecane-1,13-diamine:**

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

**2-piperazin-1-ylethylamine:**

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

**STOT - single exposure**

No data available

**STOT - repeated exposure****Components:****2-piperazin-1-ylethylamine:**

Exposure routes: Inhalation  
Target Organs: Respiratory Tract  
Assessment: Causes damage to organs through prolonged or repeated exposure.

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

4,7,10-trioxatridecane-1,13-diamine:

Species: Rat, male and female

NOAEL: &lt; 100 mg/kg

Application Route: oral (gavage)

Number of exposures: daily

Dose: 100, 300, 1000(600,day7)mg/kg

Control Group: yes

Method: OECD Test Guideline 422

2-piperazin-1-ylethylamine:

Species: Rat, male and female

NOAEL: 152 mg/kg/d

Application Route: Oral

Exposure time: 28 d

Method: OECD Test Guideline 422

Species: Rat, male and female

NOAEL: &gt; 1000 mg/kg/d

Application Route: Skin contact

Exposure time: 29 d

Number of exposures: 6h/application, 5d/week

Method: OECD Test Guideline 410

Species: Rat, male and female

NOEC: 0.2 mg/m<sup>3</sup>

Application Route: Inhalation

Exposure time: 90 d

Number of exposures: 6h/d, 5d/week

Method: OECD Test Guideline 413

Target Organs: Respiratory Tract

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

Species: Rat, male and female

NOEC: 53.3 mg/m<sup>3</sup>

Application Route: Inhalation

Exposure time: 90 d

Number of exposures: 6h/d, 5d/week

Method: OECD Test Guideline 413

**Components:**

4,7,10-trioxatridecane-1,13-diamine:

Repeated dose toxicity - Assessment : May be harmful if swallowed or in contact with skin., Causes severe skin burns and eye damage.

No adverse effect has been observed in chronic toxicity tests.

**Aspiration toxicity**

No data available

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**Experience with human exposure**

General Information:      No data available

Inhalation:      No data available

Skin contact:      No data available

Eye contact:      No data available

Ingestion:      No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

Ingestion:      No data available

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

4,7,10-trioxatridecane-1,13-diamine:

Toxicity to fish      : LC50 (Leuciscus idus (Golden orfe)): > 1,000 mg/l  
Exposure time: 96 h  
Test Type: static test  
Method: DIN 38412

4-methylcyclohexane-1,3-diamine:

Toxicity to fish      : LC50 (Brachydanio rerio (zebrafish)): > 120 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

2-methylcyclohexane-1,3-diamine:

Toxicity to fish      : LC50 (Brachydanio rerio (zebrafish)): > 120 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

2-piperazin-1-ylethylamine:

Toxicity to fish      : LC50: 2,190 mg/l  
Exposure time: 96 h

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Test Type: static test  
Test substance: Fresh water

**Components:**

4,7,10-trioxatridecane-1,13-diamine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 218.16 mg/l  
Exposure time: 48 h  
Test Type: static test  
Method: Directive 67/548/EEC, Annex V, C.2.

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

4-methylcyclohexane-1,3-diamine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 34.1 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

2-methylcyclohexane-1,3-diamine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 34.1 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

2-piperazin-1-ylethylamine:

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

**Components:**

4,7,10-trioxatridecane-1,13-diamine:

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 500 mg/l  
Exposure time: 72 h  
Test Type: static test  
Method: DIN 38412

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

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

4-methylcyclohexane-1,3-diamine:

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 220 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

2-methylcyclohexane-1,3-diamine:

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 220 mg/l  
Exposure time: 72 h

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Method: OECD Test Guideline 201

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

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

Toxicity to fish (Chronic toxicity) : No data available

**Components:**

4-methylcyclohexane-1,3-diamine:  
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3.2 mg/l  
 Exposure time: 21 d  
 Method: OECD Test Guideline 211

2-methylcyclohexane-1,3-diamine:  
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3.2 mg/l  
 Exposure time: 21 d  
 Method: OECD Test Guideline 211

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

**Components:**

4,7,10-trioxatridecane-1,13-diamine:  
 Toxicity to microorganisms : (Pseudomonas putida): 221.9 mg/l  
 End point: Growth rate  
 Exposure time: 17 h  
 Test Type: static test  
 Method: DIN 38412

**Components:**

2-piperazin-1-ylethylamine:  
 Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): 712 mg/kg  
 Exposure time: 56 d  
 Method: OECD Test Guideline 222  
  
 NOEC (Eisenia fetida (earthworms)): 500 mg/kg  
 Exposure time: 56 d  
 Method: OECD Test Guideline 222

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

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## Ecotoxicology Assessment

**Components:**

4-methylcyclohexane-1,3-diamine:  
Acute aquatic toxicity : Harmful to aquatic life.

**Components:**

4-methylcyclohexane-1,3-diamine:  
Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

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

4,7,10-trioxatridecane-1,13-diamine:  
Biodegradability : Inoculum: activated sludge  
Concentration: 30 mg/l  
Result: Not readily biodegradable.  
Biodegradation: < 10 %  
Exposure time: 60 d  
Method: OECD Test Guideline 301B

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.

4-methylcyclohexane-1,3-diamine:  
Biodegradability : Result: Not readily biodegradable.  
Biodegradation: < 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C

2-methylcyclohexane-1,3-diamine:  
Biodegradability : Result: Not biodegradable  
Biodegradation: < 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C

2-piperazin-1-ylethylamine:  
Biodegradability : Inoculum: activated sludge  
Result: Not readily biodegradable.  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Components:**

2-piperazin-1-ylethylamine:  
Biochemical Oxygen Demand (BOD) : 5 mg/l  
Incubation time: 5 d

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**Components:**

2-piperazin-1-ylethylamine:  
Chemical Oxygen Demand (COD) : 560 mg/l  
BOD/COD : No data available  
ThOD : No data available  
BOD/ThOD : No data available  
Dissolved organic carbon (DOC) : No data available  
Physico-chemical removability : No data available  
Stability in water : No data available

**Components:**

2-piperazin-1-ylethylamine:  
Photodegradation : Test Type: Air  
Degradation (direct photolysis): 50 %  
Impact on Sewage Treatment : No data available

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

2-piperazin-1-ylethylamine:  
Bioaccumulation : Species: Fish  
Remarks: Does not bioaccumulate.

**Components:**

4,7,10-trioxatridecane-1,13-diamine:  
Partition coefficient: n-octanol/water : log Pow: -1.25 (77 °F / 25 °C)  
pH: 11.1  
Method: OECD Test Guideline 107  
2-piperazin-1-ylethylamine:  
Partition coefficient: n-octanol/water : log Pow: -1.48 (68 °F / 20 °C)

**Mobility in soil**

Mobility : No data available

**Components:**

2-piperazin-1-ylethylamine:  
Distribution among environmental compartments : Koc: ca. 37000  
Stability in soil : No data available



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**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 : No data available

Global warming potential (GWP) : No data available

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

Waste from residues : 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.  
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.

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

**IATA**  
UN/ID No. : UN 2735

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Proper shipping name : Amines, liquid, corrosive, n.o.s.  
 (TRIOXATRIDEKANEDIAMINE, 4-METHYLCYCLOHEXANE-1, 3-DIAMINE)  
 Class : 8  
 Packing group : II  
 Labels : Corrosive  
 Packing instruction (cargo aircraft) : 855  
 Packing instruction (passenger aircraft) : 851

**IMDG**

UN number : UN 2735  
 Proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.  
 (TRIOXATRIDEKANEDIAMINE, 4-METHYLCYCLOHEXANE-1, 3-DIAMINE)  
 Class : 8  
 Packing group : II  
 Labels : 8  
 EmS Code : F-A, S-B  
 Marine pollutant : no

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

Not applicable for product as supplied.

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

UN/ID/NA number : UN 2735  
 Proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.  
 (TRIOXATRIDEKANEDIAMINE, 4-METHYLCYCLOHEXANE-1, 3-DIAMINE)  
 Class : 8  
 Packing group : II  
 Labels : CORROSIVE  
 ERG Code : 153  
 Marine pollutant : no

**Special precautions for user**

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

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

This material does not contain any components with a CERCLA RQ.

**SARA 311/312 Hazards** : Respiratory or skin sensitisation  
 Reproductive toxicity  
 Specific target organ toxicity (single or repeated exposure)

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Skin corrosion or irritation  
Serious eye damage or eye irritation

**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 does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**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 : Not in compliance with the inventory

NZIoC : Not in compliance with the inventory

ENCS : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.

KECI : Not in compliance with the inventory

PICCS : Not in compliance with the inventory

IECSC : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.

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.

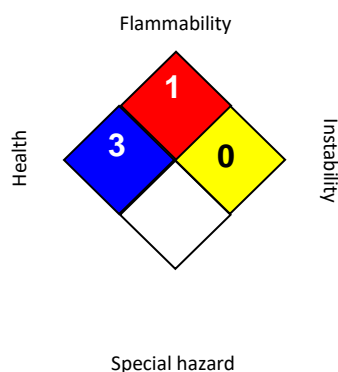
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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

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**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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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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