

ARALDITE® 2019 A

Version 2.0 Revision Date: 10/05/2020 SDS Number: 400001011815 Date of last issue: 05/27/2020
Date of first 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 the OSHA Hazard Communication Standard (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.

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Precautionary statements : **Prevention:**
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P272 Contaminated work clothing must not be allowed out of the workplace.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ eye protection/ face protection.
Response:
 P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P337 + P313 If eye irritation persists: Get medical advice/ attention.
 P362 Take off contaminated clothing and wash before reuse.
 P391 Collect spillage.
Storage:
 Not available
Disposal:
 P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	50 - 70
Glass, oxide, chemicals	65997-17-3	1 - 5
4,4'-isopropylidenebis[2-allylphenol]	1745-89-7	0.1 - 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.

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- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
- Most important symptoms and effects, both acute and delayed : None known.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- 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

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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

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. Smoking, eating and drinking should be prohibited in the application area. 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. 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

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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 ³	ACGIH
		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

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
 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

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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.
Melting point/freezing 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 ³ (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.

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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.
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.
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Acute toxicity**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:	
Acute oral toxicity	: LD50 (Rat, female): > 2,000 mg/kg
Components	: Method: OECD Test Guideline 420
	: Assessment: The substance or mixture has no acute oral toxicity

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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

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)

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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
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

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NOEL: 100 mg/kg body weight

Method: OECD Test Guideline 453
Result: negativeSpecies: 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/dayMethod: OECD Test Guideline 453
Result: negative
Target Organs: Digestive organsSpecies: Rat, females
Application Route: Oral
Exposure time: 24 month(s)
Dose: 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment: 7 days/week
NOEL: 2 mg/kg bw/dayMethod: 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

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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 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

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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

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: >= 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

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Glass, oxide, chemicals:
Species: Rat, male
LOEC: 2.4 mg/m³
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

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)): 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
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

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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
 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

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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:
 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

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Components:

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

Biochemical Oxygen Demand (BOD) : Biochemical oxygen demand
 54,82 mg O₂/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

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:

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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

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
 Distribution among environmental compartments : Koc: 445
 4,4'-isopropylidenebis[2-allylphenol]:
 Distribution among environmental compartments : Adsorption/Soil
 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.

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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.

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)
 (BISPHENOL A EPOXY RESIN, DIALLYL BISPHENOL A)
 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)(, DIALLYL BISPHENOL A)
 Class : 9
 Packing group : III
 Labels : 9
 EmS Code : F-A, S-F

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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) (BISPHENOL A EPOXY RESIN, DIALLYL BISPHENOL A)
 Class : 9
 Packing group : III
 Labels : CLASS 9
 ERG Code : 171
 Marine pollutant : yes(BISPHENOL A EPOXY RESIN)(BISPHENOL A EPOXY RESIN, DIALLYL BISPHENOL A)
 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**CERCLA Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
methanol	67-56-1	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 311/312 Hazards : Respiratory or skin sensitisation
 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).

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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.

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.

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	: On the inventory, or 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	: All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (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

The following substance(s) is/are subject to a Significant New Use Rule:

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)

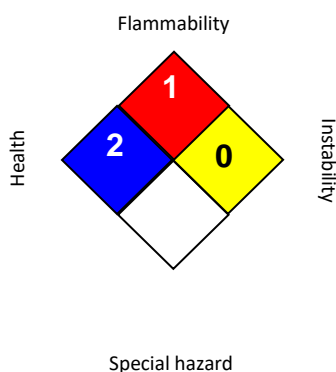
The following substance(s) is/are subject to TSCA 12(b) export notification requirements:

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

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

HEALTH		2
FLAMMABILITY		1
PHYSICAL HAZARD		0

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

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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.

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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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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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 the OSHA Hazard Communication Standard (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 elementsHazard 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-piperazinyl)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	1 - 5
2-piperazin-1-ylethylamine	140-31-8	1 - 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 (CO₂)
Carbon monoxide
Nitrogen oxides (NO_x)
- 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.
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.

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To avoid spills during handling keep bottle on a metal tray.
 Dispose of rinse water in accordance with local and national regulations.
 Do not breathe mist or vapours.

- 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
- 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

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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.
Melting point/freezing 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.
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.

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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 dioxide
carbon monoxide
Nitrogen oxides (NOx)

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 : 3,666 mg/kg
Method: Calculation method

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 exposure) : No data available

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administration)

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-piperaziny)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-piperaziny)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: Irreversible effects on the eye

Assessment: Risk of serious damage to eyes.

Respiratory or skin sensitisation**Components:**

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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: Probability or evidence of low to moderate skin sensitisation rate in humans

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

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2-piperazin-1-ylethylamine:
Genotoxicity in vitro

: Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: negative
Result: negative

Components:

2-piperazin-1-ylethylamine:
Genotoxicity in vivo

: Test Type: In vivo micronucleus test
Species: Mouse (male and female)
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.

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Reproductive toxicity**Components:**

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

2-piperazin-1-ylethylamine:

Test Type: Combined Repeated Dose Toxicity Study with the
Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Dose: 500/2000/8000 ppm
Duration of Single Treatment: 28 d
General Toxicity - Parent: No observed adverse effect
concentration: 8,000 ppm
General Toxicity F1: No-observed-effect level: 8,000 ppm
Method: OECD Test Guideline 422

Components:

4-methylcyclohexane-1,3-diamine:

Effects on foetal : Application Route: Oral
development : 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

2-piperazin-1-ylethylamine:

Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: Lowest observed adverse effect
concentration: 8,000 g/m³
Developmental Toxicity: No-observed-effect level: 8,000 ppm
Method: OECD Test Guideline 422

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Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Duration of Single Treatment: 14 d
General Toxicity Maternal: No observed adverse effect level:
1,000 mg/kg body weight
Developmental Toxicity: No-observed-effect level: 1,000
mg/kg body weight
Method: OECD Test Guideline 414

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Duration of Single Treatment: 23 d
General Toxicity Maternal: No observed adverse effect level:
75 mg/kg body weight
Developmental Toxicity: No observed adverse effect level: 75
mg/kg body weight
Method: OECD Test Guideline 414

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.

Repeated dose toxicity**Components:**

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

Species: Rat, male and female

NOAEL: < 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:

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Species: Rat, male and female
NOAEL: 152 mg/kg/d
Application Route: oral (drinking water)
Exposure time: 28 d
Method: OECD Test Guideline 422

Species: Rat, male and female
NOAEL: > 1000 mg/kg/d
Application Route: Dermal
Exposure time: 29 d
Number of exposures: 6h/d, 5d/w
Method: OECD Test Guideline 410

Species: Rat, male and female
NOEC: 0.2 mg/m³
Application Route: Inhalation
Exposure time: 90 d
Number of exposures: 6h/d, 5d/w
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/m³
Application Route: Inhalation
Exposure time: 90 d
Number of exposures: 6h/d, 5d/w
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

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

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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 (Pimephales promelas (fathead minnow)): 2,190 mg/l
End point: mortality
Exposure time: 96 h
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 : EC50 (Daphnia magna (Water flea)): 1,000 mg/l

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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

2-piperazin-1-ylethylamine:

Toxicity to microorganisms : EC50 (Bacteria): > 100 mg/l, mg/kg
Exposure time: 28 d
Method: OECD Test Guideline 216

: EC50 (activated sludge): 511 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water
Method: ISO Method, other

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

Ecotoxicology Assessment

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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 : Test Type: aerobic
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

Components:

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2-piperazin-1-ylethylamine:
 Chemical Oxygen Demand : 560 mg/l
 (COD)
 BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon : No data available
 (DOC)

Physico-chemical : No data available
 removability

Stability in water : No data available

Components:

2-piperazin-1-ylethylamine:
 Photodegradation : Test Type: Air
 Degradation (direct photolysis): 50 %

Impact on Sewage : No data available
 Treatment

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- : log Pow: -1.25 (77 °F / 25 °C)
 octanol/water pH: 11.1
 Method: OECD Test Guideline 107

2-piperazin-1-ylethylamine:
 Partition coefficient: n- : log Pow: -1.48 (68 °F / 20 °C)
 octanol/water

Mobility in soil

Mobility : No data available

Components:

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

Other adverse effects

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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
Proper shipping name : Amines, liquid, corrosive, n.o.s.

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(TRIOXATRIDECANEDIAMINE, 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.
(TRIOXATRIDECANEDIAMINE, 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.
(TRIOXATRIDECANEDIAMINE, 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**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)
Skin corrosion or irritation
Serious eye damage or eye irritation

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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.
AIIC	: 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	: All substances listed as active on the TSCA inventory

Inventories

AIIC (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

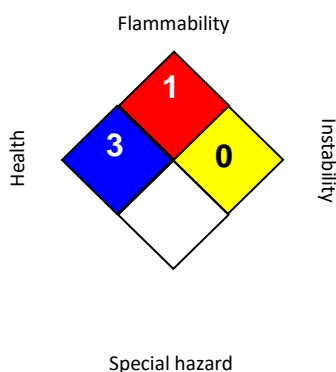
No substances are subject to a Significant New Use Rule.

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:**

HEALTH	*	3
FLAMMABILITY		1
PHYSICAL HAZARD		0

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

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

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