



## SAFETY DATA SHEET



Enriching lives through innovation

### ARALDITE® 2019 B

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	03/26/2021	400000005372	05/13/2020
			Date of first issue: 05/13/2020

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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 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-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.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Treat symptomatically.<br>Get medical attention if symptoms occur.  |
| If inhaled  | : | Consult a physician after significant exposure.<br>If inhaled, remove to fresh air.<br>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.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes.   |
| In case of eye contact                                      | : | Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed  | : | Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>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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media

- 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>)
- 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-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: 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 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

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/m<sup>3</sup>  
 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: &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:



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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/m<sup>3</sup>  
 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/m<sup>3</sup>  
 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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aquatic invertebrates      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  
 End point: Immobilization  
 Exposure time: 48 h  
 Test Type: static test  
 Test substance: Fresh water  
 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  
 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

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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 (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

**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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(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****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.

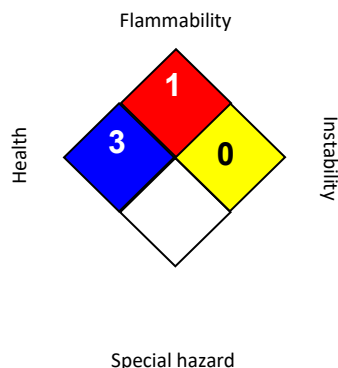
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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:**

<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 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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