

ARALDITE® 2015-1 RESIN

Version 1.1 Revision Date: 07/13/2020 SDS Number: 400001015909 Date of last issue: 02/03/2017
Date of first issue: 02/03/2017

Print Date 08/13/2020

SECTION 1. IDENTIFICATION

Product name : ARALDITE® 2015-1 RESIN

**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 : Adhesives

SECTION 2. HAZARDS IDENTIFICATION**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Skin irritation : Category 2

Serious eye damage : Category 1

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 : Danger

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H411 Toxic to aquatic life with long lasting effects.

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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 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P362 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	30 - 50
limestone	1317-65-3	20 - 30
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	9003-36-5	10 - 20
mica	12001-26-2	5 - 10
1,4-bis(2,3-epoxypropoxy)butane	2425-79-8	5 - 10
bisphenol A - epoxy resins, number average MW >700 - <1100	25068-38-6	1 - 5
2-[[3-hydroxy-2,2-bis[[[1-oxoallyl]oxy]methyl]propoxy]methyl]-2-[[[1-oxoallyl]oxy]methyl]-1,3-propanediyl diacrylate	60506-81-2	1 - 5
2-[[3-[(1-oxoallyl)oxy]-2,2-bis[[[1-oxoallyl]oxy]methyl]propoxy]methyl]-2-[[[1-oxoallyl]oxy]methyl]-1,3-propanediyl diacrylate	29570-58-9	1 - 5

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

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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.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If skin irritation persists, call a physician.
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.
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.
- 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

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- 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
Carbon dioxide (CO₂)
Carbon monoxide
- Specific extinguishing methods : No data is available on the product itself.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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

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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.
 To avoid spills during handling keep bottle on a metal tray.
 Dispose of rinse water in accordance with local and national regulations.

- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 36 - 104 °F / 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

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

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
limestone	1317-65-3	TWA (total dust)	15 mg/m ³	OSHA Z-1
		TWA (respirable fraction)	5 mg/m ³	OSHA Z-1
		TWA (Respirable)	5 mg/m ³ (Calcium carbonate)	NIOSH REL
		TWA (total)	10 mg/m ³ (Calcium carbonate)	NIOSH REL
		TWA (Total dust)	15 mg/m ³	OSHA P0
		TWA (respirable dust fraction)	5 mg/m ³	OSHA P0
mica	12001-26-2	TWA (Respirable particulate matter)	3 mg/m ³	ACGIH
		TWA (Dust)	20 Million particles per cubic	OSHA Z-3

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			foot	
		TWA (Respirable)	3 mg/m3	NIOSH REL
		TWA (respirable dust fraction)	3 mg/m3	OSHA P0

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

Material : Nitrile rubber
 Material : Neoprene gloves
 Break through time : 10 - 480 min

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 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

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Colour	:	beige
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	ca. 6 - 7 (77 °F / 25 °C) Concentration: 500 g/l
Freezing point	:	No data is available on the product itself.
Melting point	:	No data is available on the product itself.
Boiling point	:	> 392 °F / > 200 °C
Flash point	:	> 302 °F / > 150 °C Method: Pensky-Martens closed cup, closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
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	:	< 0.002 hPa (68 °F / 20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	1.4 g/cm ³ (77 °F / 25 °C)
Solubility(ies)		
Water solubility	:	practically insoluble (68 °F / 20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity		
Viscosity, dynamic	:	thixotropic

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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
Strong bases
Strong oxidizing agents
Hazardous decomposition products : carbon dioxide
carbon monoxide
Halogenated compounds

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate: 171.87 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

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:**

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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.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species: Rabbit

Method: OECD Test Guideline 404

Result: Irritating to skin.

1,4-bis(2,3-epoxypropoxy)butane:

Species: Rabbit

Method: OECD Test Guideline 404

Result: Skin irritation

GLP: yes

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

Method: OECD Test Guideline 404

Result: Skin irritation

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

limestone:

Species: Rabbit

Result: Mechanical irritation of the eyes is possible.

Assessment: No eye irritation

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

1,4-bis(2,3-epoxypropoxy)butane:

Species: Rabbit

Assessment: Risk of serious damage to eyes.

Method: OECD Test Guideline 405

GLP: yes

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

Species: Rabbit

Result: Eye irritation

Method: OECD Test Guideline 405

2-[[3-hydroxy-2,2-bis[[[(1-oxoallyl)oxy]methyl]propoxy]methyl]-2-[[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Result: Eye irritation

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2-[[3-[(1-oxoallyl)oxy]-2,2-bis[[[(1-oxoallyl)oxy]methyl]propoxy]methyl]-2-[[[(1-oxoallyl)oxy]methyl]-1,3-propanediyl diacrylate:

Assessment: Irritating to eyes.

Respiratory or skin sensitisation**Components:**

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

Test Type: Local lymph node assay (LLNA)

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

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

limestone:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: Does not cause skin sensitisation.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

1,4-bis(2,3-epoxypropoxy)butane:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

GLP: yes

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

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

Assessment: No data available

Germ cell mutagenicity**Components:**

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

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test

Test system: mouse lymphoma cells

Metabolic activation: without metabolic activation

Result: positive

Test Type: reverse mutation assay

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)

Result: negative

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Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive

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

1,4-bis(2,3-epoxypropoxy)butane:
Genotoxicity in vitro : Test Type: reverse mutation assay
Concentration: 10 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Concentration: 1 - 100 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
GLP: no
Remarks: Not classified due to data which are conclusive although insufficient for classification.

bisphenol A - epoxy resins, number average MW >700 - <1100:
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: Positive results were obtained in some in vitro tests.

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)

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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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Genotoxicity in vivo

: Cell type: Somatic
Application Route: Oral
Exposure time: 48 h
Dose: 2000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 486
Result: negative

1,4-bis(2,3-epoxypropoxy)butane:
Genotoxicity in vivo

: Test Type: In vivo micronucleus test
Species: Mouse (male)
Cell type: Somatic
Application Route: Oral
Exposure time: 4 d
Dose: 187.5 - 750 mg/kg
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Test Type: unscheduled DNA synthesis assay
Species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

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

: Cell type: Germ
Application Route: Oral
Method: OECD Test Guideline 478
Result: negative

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

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Components:

1,4-bis(2,3-epoxypropoxy)butane:

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen., Animal testing did not show any mutagenic effects.

Carcinogenicity**Components:**

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

Species: Rat, male

Application Route: Oral

Exposure time: 24 month(s)

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

Frequency of Treatment: 7 days/week

NOAEL: 15 mg/kg bw/day

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

Species: Mouse, male

Application Route: Dermal

Exposure time: 24 month(s)

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

Frequency of Treatment: 3 days/week

NOEL: 0.1 mg/kg body weight

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

Species: Rat, female

Application Route: Dermal

Exposure time: 24 month(s)

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

Frequency of Treatment: 5 days/week

NOEL: 100 mg/kg body weight

Method: OECD Test Guideline 453

Result: negative

Species: Rat, female

Application Route: Oral

Exposure time: 24 month(s)

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

Frequency of Treatment: 7 days/week

NOAEL: 100 mg/kg bw/day

Method: OECD Test Guideline 453

Result: negative

Target Organs: Digestive organs

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Species: 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/day

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

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

Species: Rat, male and female
 Application Route: Oral
 Exposure time: 24 month(s)
 Dose: 15 mg/kg
 Frequency of Treatment: 7 daily
 Method: OECD Test Guideline 453
 Result: negative

Carcinogenicity - Assessment : No data available

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

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

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

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

Reproductive toxicity**Components:**

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

Effects on fertility : Test Type: Two-generation study
 Species: Rat, male and female
 Application Route: Oral
 Dose: 0, 50, 180, 540 or 750 milligram per kilogram
 Duration of Single Treatment: 238 d
 Frequency of Treatment: 1 daily
 General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight
 General Toxicity F1: No-observed-effect level: 750 mg/kg body weight
 Symptoms: No adverse effects
 Method: OECD Test Guideline 416
 Result: No effects on fertility and early embryonic development were detected.

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Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

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

Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No-observed-effect level: 750 mg/kg body weight
General Toxicity F1: No-observed-effect level: 750 mg/kg body weight
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Components:

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

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

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

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

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Method: OECD Test Guideline 414
Result: No teratogenic effects

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species: Rabbit, female
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level:
30 mg/kg body weight
Result: No teratogenic effects

1,4-bis(2,3-epoxypropoxy)butane:

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0/30/100/300 mg/kg bw/day
Duration of Single Treatment: 17 d
General Toxicity Maternal: No observed adverse effect level:
300 mg/kg body weight
Developmental Toxicity: No observed adverse effect level:
300 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes
Remarks: Information given is based on data obtained from
similar substances.

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

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

Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

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

Reproductive toxicity - Assessment : No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

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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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Species: Rat, male and female

NOAEL: 250 mg/kg

Application Route: Ingestion

Exposure time: 13 Weeks

Number of exposures: 7 d

Method: Subchronic toxicity

1,4-bis(2,3-epoxypropoxy)butane:

Species: Rat, male and female

NOAEL: 200 mg/kg

Application Route: Oral

Exposure time: 28 d

Number of exposures: daily

Dose: 25, 100, 200, 400 mg/kg

Method: Subacute toxicity

Species: Rat, male and female

NOAEL: 263 mg/kg

Application Route: Oral

Exposure time: 90 h

Number of exposures: daily

Dose: 0,30,100,300 mg/kg bw/day

Method: OECD Test Guideline 408

GLP: yes

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

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

Species: Rat, male and female

NOAEL: 50 mg/kg

Application Route: Ingestion

Exposure time: 14 Weeks

Number of exposures: 7 d

Method: Subchronic toxicity

Species: Rat, male and female

NOEL: 10 mg/kg

Application Route: Skin contact

Exposure time: 13 Weeks

Number of exposures: 5 d

Method: Subchronic toxicity

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Ingestion: No data available

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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

limestone:

Toxicity to fish : LC50: > 56,000 mg/l
Exposure time: 96 h

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Toxicity to fish : LC50 (Fish): 2.54 mg/l
Exposure time: 96 h
Method: Calculation method

1,4-bis(2,3-epoxypropoxy)butane:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 24 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: no

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

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Components:

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.8 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.55 mg/l
Exposure time: 48 h
Method: Calculation method

1,4-bis(2,3-epoxypropoxy)butane:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 75 mg/l
End point: Immobilization
Exposure time: 24 h
Test Type: static test
Analytical monitoring: no

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Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: no

bisphenol A - epoxy resins, number average MW >700 - <1100:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Components:

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

NOEC: 4.2 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 1.8 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

1,4-bis(2,3-epoxypropoxy)butane:
Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): > 160 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

NOELR (Pseudokirchneriella subcapitata (green algae)): 40 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

bisphenol A - epoxy resins, number average MW >700 - <1100:
Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

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

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

limestone:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC50 (Daphnia magna (Water flea)): > 350 mg/l
Exposure time: 125 d
Test Type: semi-static test
Test substance: Fresh water

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

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

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

Components:

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

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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

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

1,4-bis(2,3-epoxypropoxy)butane:

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: no

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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

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
 Biodegradability : Inoculum: activated sludge
 Concentration: 3 mg/l
 Result: Not biodegradable
 Biodegradation: ca. 0 %
 Exposure time: 28 d
 Method: Directive 67/548/EEC Annex V, C.4.E.

1,4-bis(2,3-epoxypropoxy)butane:
 Biodegradability : Test Type: aerobic
 Inoculum: activated sludge
 Concentration: 20 mg/l
 Result: Not readily biodegradable.
 Biodegradation: 43 %
 Exposure time: 28 d
 Method: OECD Test Guideline 301F
 GLP: yes

Test Type: aerobic
 Inoculum: Sewage (STP effluent)
 Concentration: 20 mg/l

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Result: Not readily biodegradable.
 Biodegradation: 38 % (Dissolved organic carbon (DOC))
 Exposure time: 28 d
 Method: OECD Test Guideline 301E
 GLP: no

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

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

Biochemical Oxygen Demand (BOD) : No data available

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

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

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

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

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential**Components:**

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 150
Remarks: Does not bioaccumulate.

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

limestone:
Partition coefficient: n-octanol/water : log Pow: < 1

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:
Partition coefficient: n-octanol/water : log Pow: 2.7 - 3.6
Method: OECD Test Guideline 117

1,4-bis(2,3-epoxypropoxy)butane:
Partition coefficient: n-octanol/water : log Pow: -0.269 (77 °F / 25 °C)
pH: 6.7
Method: OECD Test Guideline 117
GLP: yes

Mobility in soil

Mobility : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Distribution among environmental compartments : Koc: 445

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Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Distribution among environmental compartments : Koc: 4460
Method: OECD Test Guideline 121

1,4-bis(2,3-epoxypropoxy)butane:

Distribution among environmental compartments : Koc: 12.59
Method: OECD Test Guideline 121

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

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

Other adverse effects

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer

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

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

Global warming potential (GWP) : No data available

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

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

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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 F EPOXY RESIN)
 Class : 9
 Packing group : III
 Labels : Miscellaneous
 Packing instruction (cargo aircraft) : 964
 Packing instruction (passenger aircraft) : 964
 Environmentally hazardous : yes

IMDG

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

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

Not applicable for product as supplied.

National Regulations**DOT Classification**

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

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ERG Code : 171
 Marine pollutant : yes(BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data 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)
toluene	108-88-3	1000	*
acrylic acid	79-10-7	5000	*
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).

California Prop. 65

WARNING: This product can expose you to chemicals including toluene, 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:

DSL : This product contains one or several components listed in the Canadian NDSL.

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

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

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

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

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

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

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

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Inventories

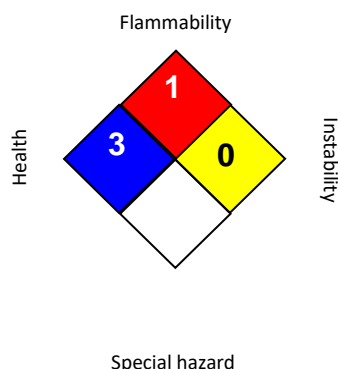
AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

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.

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

Revision Date : 07/13/2020

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

NIOSH REL : USA. NIOSH Recommended Exposure Limits

OSHA P0 : USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

OSHA Z-3 : USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts

ACGIH / TWA : 8-hour, time-weighted average

NIOSH REL / TWA : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek

OSHA P0 / TWA : 8-hour time weighted average

OSHA Z-1 / TWA : 8-hour time weighted average

OSHA Z-3 / 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.

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

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

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

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ARALDITE® 2015-1 HARDENER

Version 1.1 Revision Date: 03/11/2019 SDS Number: 400000004944 Date of last issue: 08/30/2017
 Date of first issue: 08/30/2017

SECTION 1. IDENTIFICATION

Product name : ARALDITE® 2015-1 HARDENER

**Manufacturer or supplier's details**

Company name of supplier : Huntsman Advanced Materials Americas LLC
 Address : P.O. Box 4980
 The Woodlands,
 TX 77387
 United States of America (USA)
 Telephone : Non-Emergency: (800) 257-5547
 E-mail address of person responsible for the SDS : SDS@huntsman.com
 Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

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

Skin corrosion : Category 1A
 Serious eye damage : Category 1
 Skin sensitisation : Category 1
 Short-term (acute) aquatic hazard : Category 3
 Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :



Signal word : Danger

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

Precautionary statements : **Prevention:**

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

Response:

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

Storage:

P405 Store locked up.

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Amines

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
barium sulfate	7727-43-7	30 - 50
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4	30 - 50
bis(isopropyl)naphthalene	38640-62-9	5 - 10
Triethylenetetramine, propoxylated	26950-63-0	5 - 10
2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine	25513-64-8	5 - 10
2,4,6-tris(dimethylaminomethyl)phenol	90-72-2	1 - 2.5

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

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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 : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.
- Most important symptoms and effects, both acute and delayed : None known.
- Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : High volume water jet
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : No hazardous combustion products are known

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- Specific extinguishing methods : No data is available on the product itself.
- Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

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 : Neutralise with acid.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Do not breathe vapours/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.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Keep in properly labelled containers.
- Materials to avoid : For incompatible materials please refer to Section 10 of this

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Recommended storage temperature : 36 - 104 °F / 2 - 40 °C
 Further information on storage stability : No decomposition if stored and applied as directed.

Stable under normal conditions.

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

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

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

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

Material : Nitrile rubber
 Break through time : 10 - 480 min

Remarks : Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
 The suitability for a specific workplace should be discussed with the producers of the protective gloves.

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

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

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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 : beige

Odour : amine-like

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

pH : ca. 11 (68 °F / 20 °C)
Concentration: 500 g/l

Melting point/freezing point : No data available

Boiling point : > 392 °F / > 200 °C

Flash point : > 212 °F / > 100 °C
Method: Pensky-Martens closed cup

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

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

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

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

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

Vapour pressure : 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 : 1.42 g/cm³ (73 °F / 23 °C)

Solubility(ies)

Water solubility : insoluble

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

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

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

Decomposition temperature : > 392 °F / > 200 °C

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

Viscosity
Viscosity, dynamic : 50,000 - 100,000 mPa.s (68 °F / 20 °C)

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

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

Molecular weight : No data available

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 : No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate: 59.52 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

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

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Skin corrosion/irritation**Components:**

barium sulfate:

Species: human skin

Assessment: No skin irritation

Result: No skin irritation

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.

bis(isopropyl)naphthalene:

Species: Rabbit

Exposure time: 4 h

Assessment: No skin irritation

Method: OECD Test Guideline 404

Result: Normally reversible injuries

Triethylenetetramine, propoxylated:

Species: Rabbit

Exposure time: 72 h

Method: OECD Test Guideline 404

Result: Irritating to skin.

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Species: Rabbit

Result: Corrosive after 3 minutes or less of exposure

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

Species: Rabbit

Method: OECD Test Guideline 404

Result: Corrosive after 1 to 4 hours of exposure

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

barium sulfate:

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: slight irritation

Assessment: Mild eye irritant

bis(isopropyl)naphthalene:

Species: Rabbit

Result: No eye irritation

Assessment: No eye irritation

Method: OECD Test Guideline 405

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Triethylenetetramine, propoxylated:

Result: Eye irritation

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Species: Rabbit

Result: Corrosive

Method: OECD Test Guideline 405

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

Species: Rabbit

Result: Corrosive

Assessment: Corrosive

Respiratory or skin sensitisation**Components:**

barium sulfate:

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

Result: Does not cause skin sensitisation.

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

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: May cause sensitisation by skin contact.

bis(isopropyl)naphthalene:

Test Type: Maximisation Test

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: Does not cause skin sensitisation.

Triethylenetetramine, propoxylated:

Exposure routes: Skin

Method: OECD Test Guideline 429

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

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: The product is a skin sensitizer, sub-category 1A.

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

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: Does not cause skin sensitisation.

Components:

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bis(isopropyl)naphthalene:
Assessment:

May be harmful if swallowed or if inhaled.
Does not cause skin sensitisation.

Germ cell mutagenicity**Components:**

barium sulfate:

Genotoxicity in vitro

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

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

bis(isopropyl)naphthalene:
Genotoxicity in vitro

: Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Concentration: 9.5 - 60 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

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

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

Triethylenetetramine, propoxylated:

Genotoxicity in vitro

: Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Method: OECD Test Guideline 476
Result: negative

Test Type: Ames test
Test system: Salmonella typhimurium
Method: OECD Test Guideline 471
Result: positive

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Method: OECD Test Guideline 473

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Result: negative

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium
Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative

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

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Concentration: 2 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

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

Genotoxicity in vitro : Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

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

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

Components:

bis(isopropyl)naphthalene:

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

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Genotoxicity in vivo : Species: Chinese hamster (male and female)
Cell type: Bone marrow
Application Route: Oral
Dose: 825 - 1000 mg/kg
Method: OECD Test Guideline 474
Result: negative

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Test Type: In vivo micronucleus test
 Species: Mouse (male and female)
 Application Route: Oral
 Dose: 850 - 1000 mg/kg
 Method: OECD Test Guideline 474
 Result: negative

Components:

bis(isopropyl)naphthalene:
 Germ cell mutagenicity-
 Assessment : Tests on bacterial or mammalian cell cultures did not show
 mutagenic effects.

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

Germ cell mutagenicity-
 Assessment : No data available

Carcinogenicity**Components:**

barium sulfate:
 Species: Rat, male and female
 Application Route: Oral
 Exposure time: 104 weeks
 Dose: 60 - 75 mg/kg
 Method: OPPTS 870.4200
 Result: negative

Species: Mouse, male and female
 Application Route: Oral
 Dose: 160 - 200 mg/kg
 Method: OPPTS 870.4200
 Result: negative

Carcinogenicity -
 Assessment : No data available

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

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

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

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

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Reproductive toxicity**Components:**

Triethylenetetramine, propoxylated:

Effects on fertility : Test Type: Fertility
Species: Rat, male and female
Strain: wistar
Application Route: Ingestion
Dose: 100, 300 and 750 milligram per kilogram
General Toxicity - Parent: No-observed-effect level: Measured
750 mg/kg body weight
General Toxicity F1: No-observed-effect level: Measured 750
mg/kg body weight
Method: OECD Test Guideline 422

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Species: Rat, male and female
Application Route: Oral
Dose: 10, 60, 120 mg/kg bw/day
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic
development were detected.

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

Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

Components:

bis(isopropyl)naphthalene:

Effects on foetal development : Species: Rat, female
Application Route: Oral
Dose: 100, 250, 625 mg/kg
Duration of Single Treatment: 20 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: Lowest observed adverse effect
level: 250 mg/kg body weight
Teratogenicity: No observed adverse effect level: 625 mg/kg
body weight
Embryo-foetal toxicity: No observed adverse effect level: 625
mg/kg body weight
Method: Directive 67/548/EEC, Annex V, B.31.
Result: No teratogenic effects

Triethylenetetramine, propoxylated:

Species: Rat, male and female
Strain: wistar
Application Route: Ingestion
Dose: 100, 300 and 750 milligram per kilogram
General Toxicity Maternal: No-observed-effect level:
Measured 300 mg/kg body weight
Developmental Toxicity: No observed adverse effect level:

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Measured 750 mg/kg body weight
Method: OECD Test Guideline 422

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
50,000 ppm
Result: No teratogenic effects

Components:

bis(isopropyl)naphthalene:

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

Triethylenetetramine, propoxylated:

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

STOT - single exposure

No data available

STOT - repeated exposure**Components:**

Triethylenetetramine, propoxylated:

Exposure routes: Ingestion

Target Organs: Kidney

Assessment: No significant health effects observed at a concentration of 300mg/kg bw/day.

Repeated dose toxicity**Components:**

barium sulfate:

Species: Rat

LOEC: \geq 104 mg/kg, 40 mg/m³

Application Route: Ingestion

Test atmosphere: dust/mist

Exposure time: 5 h

Number of exposures: 5 d

Method: Subchronic toxicity

bis(isopropyl)naphthalene:

Species: Rat, male and female

NOAEL: 170 mg/kg

Application Route: oral (feed)

Exposure time: 4,320 h

Number of exposures: 7 d

Dose: 170, 340, and 670 mg/kg

Method: Subchronic toxicity

Remarks: No significant adverse effects were reported

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Triethylenetetramine, propoxylated:

Species: Rat, male and female

NOAEL: 300 mg/kg

Application Route: Ingestion

Exposure time: 43 - 44 Days

Method: OECD Test Guideline 422

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Species: Rat, male and female

NOAEL: 10 mg/kg bw/day

Application Route: Ingestion

Exposure time: 13 Weeks

Number of exposures: Daily

Dose: 10, 60, 180mg/kg bw

Target Organs: Liver

Species: Rat, male and female

LOAEL: 60 mg/kg bw/day

Application Route: Ingestion

Exposure time: 13 Weeks

Number of exposures: Daily

Dose: 10, 60, 180mg/kg bw

Target Organs: Liver

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

Species: Rat, male and female

NOEL: 15 mg/kg

Application Route: Ingestion

Exposure time: 1,032 h

Number of exposures: 7 d

Method: Subacute toxicity

Components:

bis(isopropyl)naphthalene:

Repeated dose toxicity -

Assessment

: May be harmful if swallowed or if inhaled.

No adverse effect has been observed in chronic toxicity tests.

Aspiration toxicity**Components:**

bis(isopropyl)naphthalene:

May be fatal if swallowed and enters airways.

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

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Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

Ingestion: No data available

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

barium sulfate:

Toxicity to fish : LC50: 174 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

bis(isopropyl)naphthalene:

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

Triethylenetetramine, propoxylated:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): Measured > 4.1 mg/l
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 203

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 174 mg/l
Exposure time: 48 h
Method: DIN 38412

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

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 175 mg/l
Exposure time: 96 h

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Test Type: static test
Test substance: Fresh water

Components:

barium sulfate:

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

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

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

bis(isopropyl)naphthalene:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.16 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
Remarks: No toxicity at the limit of solubility

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

Triethylenetetramine, propoxylated:

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

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.5 mg/l
Exposure time: 24 h
Method: DIN 38412

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

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

Components:

barium sulfate:

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

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

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

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

bis(isopropyl)naphthalene:

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

Triethylenetetramine, propoxylated:

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): Measured 4.1 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

ErC10 (Pseudokirchneriella subcapitata (algae)): Measured 0.11 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (algae)): 43.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (algae)): 37.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (algae)): 16 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

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

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

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

Components:

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

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
 Toxicity to fish (Chronic toxicity) : NOEC (Brachydanio rerio (zebrafish)): 10.9 mg/l
 Exposure time: 30 d
 Method: OECD Test Guideline 210

Lowest Observed Effect Concentration (Brachydanio rerio (zebrafish)): 10.9 mg/l
 Exposure time: 30 d
 Method: OECD Test Guideline 210

Components:

barium sulfate:
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 5.8 mg/l
 Exposure time: 21 d
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 211

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

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
 Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 1.02 mg/l
 Exposure time: 21 d
 Method: OECD Test Guideline 211

Lowest Observed Effect Concentration (Daphnia magna (Water flea)): 1.02 mg/l
 Exposure time: 21 d
 Method: OECD Test Guideline 211

Components:

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

Components:

Triethylenetetramine, propoxylated:

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Toxicity to microorganisms : EC10 (activated sludge): 38 mg/l
 Exposure time: 3 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 209

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
 Toxicity to microorganisms : IC50 (Pseudomonas putida): 89 mg/l
 Exposure time: 17 h

Components:

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
 Toxicity to soil dwelling organisms : NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
 Exposure time: 56 d
 Method: OECD Test Guideline 222

EC50 (Eisenia fetida (earthworms)): >= 1,000 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

Components:

bis(isopropyl)naphthalene:
 Acute aquatic toxicity : No toxicity at the limit of solubility

Components:

2,4,6-tris(dimethylaminomethyl)phenol:
 Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Persistence and degradability**Components:**

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated:
 Biodegradability : Result: Not readily biodegradable.

bis(isopropyl)naphthalene:
 Biodegradability : Inoculum: activated sludge
 Concentration: 0.2 mg/l
 Result: Not readily biodegradable.
 Biodegradation: 30 - 35 %

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Exposure time: 56 d
Method: OECD Test Guideline 310

Triethylenetetramine, propoxylated:

Biodegradability : Inoculum: Domestic sewage
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:

Biodegradability : Inoculum: activated sludge
Concentration: 11.4 mg/l
Result: Not readily biodegradable.
Biodegradation: 7 %
Exposure time: 28 d

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

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

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand (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:**Triethylenetetramine, propoxylated:**

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): > 1 yr (77 °F / 25 °C) pH: 9
Method: OECD Test Guideline 111

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Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential**Components:**

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

Components:

bis(isopropyl)naphthalene:
Partition coefficient: n-octanol/water : log Pow: 6.081
Method: QSAR

Triethylenetetramine, propoxylated:
Partition coefficient: n-octanol/water : log Pow: -2.42

2,2,4(or 2,4,4)-trimethylhexane-1,6-diamine:
Partition coefficient: n-octanol/water : log Pow: -0.3 (77 °F / 25 °C)
Method: OECD Test Guideline 117

2,4,6-tris(dimethylaminomethyl)phenol:
Partition coefficient: n-octanol/water : log Pow: 0.219 (70.7 °F / 21.5 °C)
Method: OPPTS 830.7550

Mobility in soil

Mobility : No data available

Components:

bis(isopropyl)naphthalene:
Distribution among environmental compartments : Koc: 36108
Method: QSAR

Stability in soil : No data available

Other adverse effects

Environmental fate and pathways : No data available

Components:

Triethylenetetramine, propoxylated:
Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

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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.
Harmful to aquatic life.
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.

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.

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

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

UN/ID No. : UN 2735
Proper shipping name : Polyamines, liquid, corrosive, n.o.s.
(TRIMETHYLHEXAMETHYLENEDIAMINE,
DIISOPROPYLNAPHTHALENE ISOMERS)
Class : 8
Packing group : III
Labels : Corrosive
Packing instruction (cargo
aircraft) : 856
Packing instruction
(passenger aircraft) : 852

IMDG

UN number : UN 2735
Proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(TRIMETHYLHEXAMETHYLENEDIAMINE,
DIISOPROPYLNAPHTHALENE ISOMERS)
Class : 8
Packing group : III
Labels : 8
EmS Code : F-A, S-B
Marine pollutant : yes

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

Not applicable for product as supplied.

National Regulations**DOT Classification**

UN/ID/NA number : UN 2735
Proper shipping name : POLYAMINES, LIQUID, CORROSIVE, N.O.S.
(TRIMETHYLHEXAMETHYLENEDIAMINE,
DIISOPROPYLNAPHTHALENE ISOMERS)
Class : 8
Packing group : III
Labels : CORROSIVE
ERG Code : 153
Marine pollutant : yes(DIISOPROPYLNAPHTHALENE ISOMERS)

Special precautions for user

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

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

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

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

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

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

California Prop. 65

This product 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:

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

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

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

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

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

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

PICCS : Not in compliance with the inventory

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

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

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

Inventories

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

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

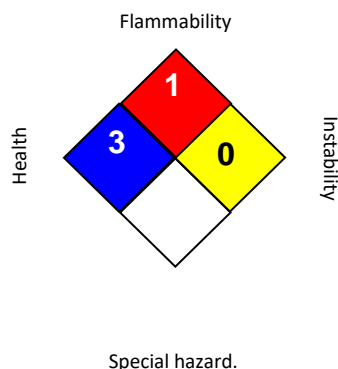
No substances are subject to a Significant New Use Rule.

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

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

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

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

Revision Date : 03/11/2019

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
 OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1
 Limits for Air Contaminants
 ACGIH / TWA : 8-hour, time-weighted average
 OSHA Z-1 / TWA : 8-hour time weighted average

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

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

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

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

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