



## SAFETY DATA SHEET



Enriching lives through innovation

### ARALDITE® 2015-1 RESIN

Version	Revision Date:	SDS Number:	Date of last issue: 07/13/2020
1.2	02/15/2022	400001015909	Date of first issue: 02/03/2017

Print Date 05/04/2022

#### 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

Chronic aquatic toxicity : 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.

Precautionary statements : **Prevention:**

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P261 Avoid breathing mist or vapours.  
 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
calcium carbonate	471-34-1	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-	29570-58-9	1 - 5



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oxoallyl)oxy)methyl]-1,3-propanediyl diacrylate		
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The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

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

**SECTION 4. FIRST AID MEASURES**

- General advice : Move out of dangerous area.  
 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.

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Notes to physician : Treat symptomatically.

**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : Water spray  
 Alcohol-resistant foam  
 Carbon dioxide (CO<sub>2</sub>)  
 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 (CO<sub>2</sub>)  
 Carbon monoxide
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- 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 : Normal measures for preventive fire protection.



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fire and explosion

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.  
 Do not breathe vapours/dust.  
 Avoid exposure - obtain special instructions before use.  
 Avoid contact with skin and eyes.  
 For personal protection see section 8.  
 Smoking, eating and drinking should be prohibited in the application area.  
 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
calcium carbonate	471-34-1	TWA (Respirable)	5 mg/m <sup>3</sup> (Calcium carbonate)	NIOSH REL
		TWA (total)	10 mg/m <sup>3</sup> (Calcium carbonate)	NIOSH REL
mica	12001-26-2	TWA (Respirable particulate matter)	0.1 mg/m <sup>3</sup>	ACGIH
		TWA (Dust)	20 Million particles per cubic foot	OSHA Z-3
		TWA (Respirable)	3 mg/m <sup>3</sup>	NIOSH REL



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		TWA (respirable dust fraction)	3 mg/m3	OSHA P0
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**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  
 Colour : beige  
 Odour : slight



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Odour Threshold	: No data is available on the product itself.
pH	: ca. 6 - 7 (77 °F / 25 °C) Concentration: 500 g/l
Melting point/freezing 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 <sup>3</sup> (77 °F / 25 °C)
Solubility(ies)	
Water solubility	: practically insoluble (68 °F / 20 °C)
Solubility in other solvents	: No data is available on the product itself.
Partition coefficient: n-octanol/water	: No data is available on the product itself.
Auto-ignition temperature	: No data is available on the product itself.
Decomposition temperature	: > 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT)	: No data is available on the product itself.
Viscosity	
Viscosity, dynamic	: thixotropic
Explosive properties	: No data is available on the product itself.
Oxidizing properties	: No data is available on the product itself.

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

**SECTION 10. STABILITY AND REACTIVITY**

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

Chemical stability : Stable under normal conditions.

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

Conditions to avoid : None known.

Incompatible materials : Strong acids  
Strong bases  
Strong oxidizing agents

Hazardous decomposition products : carbon dioxide  
carbon monoxide  
Halogenated compounds

**SECTION 11. TOXICOLOGICAL INFORMATION****Acute toxicity****Product:**

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

Acute inhalation toxicity : Acute toxicity estimate: 23.44 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Calculation method

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

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

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg  
Method: OECD Test Guideline 420  
Assessment: The substance or mixture has no acute oral toxicity  
Remarks: No mortality observed at this dose.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**calcium carbonate:**

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg



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Method: OECD Test Guideline 420  
 Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 3 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403  
 Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat, male and female): 1,163 mg/kg  
 Method: OECD Test Guideline 401  
 GLP: yes  
 Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat): > 2.068 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Test atmosphere: dust/mist  
 Method: Expert judgement  
 Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : Acute toxicity estimate: 1,100 mg/kg  
 Method: Converted acute toxicity point estimate  
 Assessment: The component/mixture is moderately toxic after single contact with skin.

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

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

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg

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Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rabbit  
 Exposure time : 4 h  
 Assessment : Irritating to skin.  
 Method : OECD Test Guideline 404  
 Result : Irritating to skin.

**calcium carbonate:**

Species : Rabbit  
 Assessment : No skin irritation  
 Method : OECD Test Guideline 404  
 Result : No skin irritation

**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

**calcium carbonate:**

Species : Rabbit  
 Result : No eye irritation  
 Assessment : No eye irritation  
 Method : OECD Test Guideline 405



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

Result : Eye irritation

**2-[[3-[[1-(1-oxoallyl)oxy]-2,2-bis[[1-(1-oxoallyl)oxy]methyl]propoxy]methyl]-2-[[1-(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.

**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

Assessment : Harmful if inhaled.



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**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.

**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

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

Test Type: gene mutation test  
 Species: Rat (male)  
 Cell type: Somatic  
 Application Route: Oral  
 Dose: 50,250,500,1000 mg/kg bw/day  
 Method: OECD Test Guideline 488  
 Result: negative

**calcium carbonate:**

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

Concentration: 0 - 250 µg/L  
 Metabolic activation: with and without metabolic activation  
 Method: OECD Test Guideline 476  
 Result: negative

**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

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Result: positive

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

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 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.

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

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GLP: yes

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

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

**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

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

**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



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Target Organs : Digestive organs

Species : Rat, female  
 Application Route : Dermal  
 Exposure time : 24 month(s)  
 Dose : 0.1, 100, 1000 mg/kg bw/day  
 Frequency of Treatment : 5 days/week  
 NOEL : 100 mg/kg body weight  
 Method : OECD Test Guideline 453  
 Result : negative

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

Species : Rat, females  
 Application Route : Oral  
 Exposure time : 24 month(s)  
 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

**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.

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

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

**Reproductive toxicity****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Effects on fertility : Test Type: Two-generation study  
 Species: Rat, male and female



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Application Route: Oral  
 Dose: 0, 50, 180, 540 or 750 milligram per kilogram  
 Duration of Single Treatment: 238 d  
 Frequency of Treatment: 1 daily  
 General Toxicity - Parent: NOEL: 540 mg/kg body weight  
 General Toxicity F1: NOEL: 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.

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: NOAEL: 30 mg/kg body weight  
 Developmental Toxicity: NOAEL: 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: NOAEL: 60 mg/kg body weight  
 Developmental Toxicity: NOAEL: 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: NOAEL: 180 mg/kg body weight  
 Developmental Toxicity: NOAEL: > 540 mg/kg body weight  
 Method: OECD Test Guideline 414  
 Result: No teratogenic effects

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

Effects on fertility

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

Effects on foetal development

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





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

Effects on foetal development : 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: NOAEL: 300 mg/kg body weight  
 Developmental Toxicity: NOAEL: 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:**

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

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

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

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

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Repeated dose toxicity****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Species : Rat, male and female  
 NOAEL : 50 mg/kg  
 Application Route : oral (gavage)  
 Exposure time : 14 Weeks  
 Number of exposures : 7 d

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

Repeated dose toxicity - Assessment : Harmful if inhaled.

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

Species : Rat, male and female  
 NOAEL : 50 mg/kg  
 Application Route : Ingestion



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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

**Aspiration toxicity**

No data available

**Experience with human exposure**

No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

No data available

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l  
 Exposure time: 96 h  
 Method: OECD Test Guideline 203

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

Toxicity to algae/aquatic : EC50: 11 mg/l  
 plants  
 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

Toxicity to daphnia and other : NOEC (Daphnia magna (Water flea)): 0.3 mg/l  
 aquatic invertebrates  
 Exposure time: 21 d

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(Chronic toxicity)      Test Type: semi-static test  
 Test substance: Fresh water  
 Method: OECD Test Guideline 211

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

**Ecotoxicology Assessment**

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

**calcium carbonate:**

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

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

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

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.

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 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



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- 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  
 Test substance: Fresh water  
 Method: OECD Test Guideline 202  
 GLP: no
- 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
- 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
- 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
- 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
- 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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**Persistence and degradability****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

Biodegradability : 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

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

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

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

**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 : 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

aerobic  
 Inoculum: Sewage (STP effluent)  
 Concentration: 20 mg/l  
 Dissolved organic carbon (DOC)  
 Result: Not readily biodegradable.  
 Biodegradation: 38 %  
 Exposure time: 28 d  
 Method: OECD Test Guideline 301E  
 GLP: no

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

Biodegradability : aerobic



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

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

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

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

**Bioaccumulative potential****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

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

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

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

Bioaccumulation : Species: Fish  
 Bioconcentration factor (BCF): 150  
 Remarks: Does not bioaccumulate.

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

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

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

**Mobility in soil****Components:****2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:**

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Distribution among environmental compartments : Koc: 445

**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

**Other adverse effects****Product:**

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

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

Waste from residues : Dispose of contents and container in accordance with all local, regional, national and international regulations.  
 Do not dispose of waste into sewer.  
 Do not contaminate ponds, waterways or ditches with chemical or used container.

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

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

UN/ID No. : UN 3082  
 Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.  
 (BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY)



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

**IMDG-Code**

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****49 CFR**

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  
 ERG Code : 171  
 Marine pollutant : yes  
 Remarks : Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

**Special precautions for user**

Remarks : 49CFR: no dangerous good in non-bulk packaging

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**

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

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

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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](http://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.
AIIC	: 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	: 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 or in compliance with the active portion of 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), TECI (Thailand), TSCA (USA)

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

No substances are subject to a Significant New Use Rule.

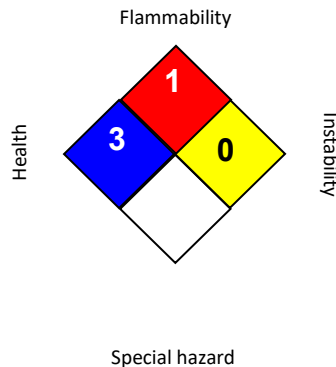
**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

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

Revision Date	:	02/15/2022
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
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-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.

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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