

EPOCAST® 1652 B US

Version 2.0 Revision Date: 07/19/2022 SDS Number: 400001008586 Date of last issue: 04/24/2018
Date of first issue: 05/06/2016

Print Date 07/20/2022

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1652 B US

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 : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

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

Flammable liquids : Category 4

Skin corrosion : Category 1B

Serious eye damage : Category 1

Skin sensitisation : Category 1

Specific target organ toxicity
- single exposure : Category 3 (Respiratory system)**GHS label elements**

Hazard pictograms :



Signal word : Danger

Hazard statements : H227 Combustible liquid.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H335 May cause respiratory irritation.

Precautionary statements : **Prevention:**
P210 Keep away from heat/ sparks/ open flames/ hot surfaces.

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No smoking.
 P261 Avoid breathing mist or vapours.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P272 Contaminated work clothing must not be allowed out of the workplace.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
 P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
 P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P363 Wash contaminated clothing before reuse.
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P403 + P235 Store in a well-ventilated place. Keep cool.
 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)
Formaldehyde, reaction products with hexahydro-1,3-isobenzofurandione and triethylenetetramine	68478-68-2	70 - 90
2-dimethylaminoethanol	108-01-0	10 - 20
trientine	112-24-3	0.1 - 1

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

SECTION 4. FIRST AID MEASURES

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

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SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides
Nitrogen oxides (NO_x)
- 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.
For safety reasons in case of fire, cans should be stored separately in closed containments.
Use a water spray to cool fully closed containers.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Ensure adequate ventilation.
Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

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Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
 Avoid formation of aerosol.
 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.
 Provide sufficient air exchange and/or exhaust in work rooms.
 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 : No smoking.
 Keep container tightly closed in a dry and well-ventilated place.
 Observe label precautions.
 Keep in properly labelled containers.

Materials to avoid : For incompatible materials please refer to Section 10 of this SDS.

Recommended storage temperature : 36 - 104 °F / 2 - 40 °C

Further information on storage stability : Stable under normal conditions.

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

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Material : butyl-rubber

Break through time : > 8 h

Material : Solvent-resistant gloves (butyl-rubber)

Material : Nitrile rubber

Break through time : 10 - 480 min

Remarks : Chemical-resistant, impervious gloves complying with an

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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 | : | liquid |
| Colour | : | amber |
| Odour | : | amine-like |
| Odour Threshold | : | No data is available on the product itself. |
| pH | : | substance/mixture is non-soluble (in water) |
| Melting point/freezing point | : | No data is available on the product itself. |
| Boiling point | : | No data is available on the product itself. |
| Flash point | : | 145 °F / 63 °C
Method: closed cup |
| Evaporation rate | : | No data is available on the product itself. |
| Flammability (solid, gas) | : | No data is available on the product itself. |
| Flammability (liquids) | : | No data is available on the product itself. |
| Upper explosion limit / Upper flammability limit | : | No data is available on the product itself. |
| Lower explosion limit / Lower flammability limit | : | No data is available on the product itself. |
| Vapour pressure | : | No data is available on the product itself. |
| Relative vapour density | : | No data is available on the product itself. |
| Relative density | : | 1.1 |

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Density : 0.98 g/cm³ (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 : 500 mPa.s (77 °F / 25 °C)

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 : Vapours may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

Incompatible materials : Strong acids and strong bases
Strong oxidizing agents

Hazardous decomposition products : carbon dioxide
carbon monoxide
Nitrogen oxides (NO_x)

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

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

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Acute inhalation toxicity : Acute toxicity estimate: 29.97 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

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

Components:**2-dimethylaminoethanol:**

Acute oral toxicity : LD50 (Rat, male and female): 1,182.7 mg/kg
Method: OECD Test Guideline 401
GLP: yes
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat, male and female): 5.983 mg/l, 1641 ppm
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
Assessment: The component/mixture is toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male): 1,219 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

trientine:

Acute oral toxicity : LD50 (Rat, male and female): 1,716.2 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rabbit, male and female): 1,465.4 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is moderately toxic after single contact with skin.

Skin corrosion/irritation**Components:****Formaldehyde, reaction products with hexahydro-1,3-isobenzofurandione and triethylenetetramine:**

Species : No information available.
Result : Severe skin irritation

2-dimethylaminoethanol:

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Causes burns.

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GLP : yes

trientine:

Species : reconstructed human epidermis (RhE)
Assessment : Causes burns.
Method : OECD Test Guideline 435
Result : Corrosive after 3 minutes to 1 hour of exposure

Species : Rabbit
Assessment : Causes burns.
Method : OECD Test Guideline 404
Result : Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation**Components:****Formaldehyde, reaction products with hexahydro-1,3-isobenzofurandione and triethylenetetramine:**

Result : Irritating to eyes.

2-dimethylaminoethanol:

Species : Rabbit
Result : Irreversible effects on the eye
Assessment : Risk of serious damage to eyes.
Method : OECD Test Guideline 405

trientine:

Species : Rabbit
Result : Irreversible effects on the eye
Assessment : Risk of serious damage to eyes.
Method : OECD Test Guideline 405

Respiratory or skin sensitisation**Components:****Formaldehyde, reaction products with hexahydro-1,3-isobenzofurandione and triethylenetetramine:**

Exposure routes : Dermal
Species : Guinea pig
Method : OECD Test Guideline 406
Result : May cause sensitisation by skin contact.
Remarks : Information taken from reference works and the literature.

2-dimethylaminoethanol:

Exposure routes : Skin
Species : Guinea pig
Assessment : Did not cause sensitisation on laboratory animals.
Result : Did not cause sensitisation on laboratory animals.

trientine:

Exposure routes : Skin

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Species : Guinea pig
Assessment : Probability or evidence of skin sensitisation in humans
Method : OECD Test Guideline 406
Result : Probability or evidence of skin sensitisation in humans

Germ cell mutagenicity**Components:****2-dimethylaminoethanol:**

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

Test Type: gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 479
Result: negative
GLP: yes

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Intraperitoneal injection
Dose: 75 mg/kg
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Intraperitoneal injection
Dose: 270 - 860 mg/kg
Method: OECD Test Guideline 474
Result: negative

trientine:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes

Test Type: Micronucleus test
Test system: Human lymphocytes

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Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 487
 Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
 Species: Mouse (male and female)
 Cell type: Bone marrow
 Application Route: Intraperitoneal injection
 Dose: 0 - 600 mg/kg
 Method: OECD Test Guideline 474
 Result: negative

Carcinogenicity**Components:****trientine:**

Species : Mouse, male
 Application Route : Dermal
 NOAEL : ≥ 50 mg/kg bw/day
 Method : OECD Test Guideline 451
 Result : negative

Species : Mouse, male
 Application Route : Dermal
 Exposure time : 104 weeks
 NOAEL : ≥ 20 mg/kg bw/day
 Method : OECD Test Guideline 451
 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-dimethylaminoethanol:**

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
 Species: Rat, male and female
 Application Route: Oral
 Dose: 200/1000/5000ppm
 General Toxicity - Parent: NOAEL: 1,000 ppm
 General Toxicity F1: NOAEL: 2,500 ppm
 Method: OECD Test Guideline 422

Test Type: Reproduction / Developmental Toxicity Screening Test
 Species: Rat, male and female
 Application Route: Oral

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Dose: 0/300/600 mg(kg bw/day)
 Duration of Single Treatment: 14 d
 General Toxicity - Parent: NOAEL: 300 mg/kg body weight
 General Toxicity F1: NOAEL: 300 mg/kg body weight
 Method: OECD Test Guideline 421

Species: Rat, male and female
 Application Route: Oral
 Dose: 0/15/50/150 mg/kg bw/d
 General Toxicity - Parent: NOAEL: 50 mg/kg body weight
 General Toxicity F1: NOAEL: 50 mg/kg body weight
 Method: OECD Test Guideline 443

Effects on foetal
 development

: Test Type: Pre-natal
 Species: Rat, female
 Application Route: Inhalation
 Dose: 0/10/30/100 ppm
 Duration of Single Treatment: 6 h
 Frequency of Treatment: 7 days/week
 General Toxicity Maternal: NOAEL: 10 ppm
 Developmental Toxicity: NOAEL: >= 100 ppm
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

Test Type: Pre-natal
 Species: Rabbit, female
 Application Route: Oral
 Dose: 0/30/100/250 mg/kg bw/d
 Duration of Single Treatment: 22 d
 Frequency of Treatment: 7 days/week
 General Toxicity Maternal: NOAEL: 100 mg/kg body weight
 Developmental Toxicity: NOAEL: 250 mg/kg body weight
 Method: OECD Test Guideline 414
 GLP: yes

trientine:

Effects on foetal
 development

: Test Type: Pre-natal
 Species: Rat
 Application Route: Oral
 Dose: 75/325/750 mg/kg bw/day
 Duration of Single Treatment: 10 d
 General Toxicity Maternal: NOAEL: >= 750 mg/kg body weight
 Developmental Toxicity: NOAEL: >= 750 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

Test Type: Pre-natal
 Species: Rabbit
 Application Route: Dermal
 Dose: 5/50/125 mg/kg bw/day
 Duration of Single Treatment: 13 d
 General Toxicity Maternal: NOAEL: 50 mg/kg body weight
 Developmental Toxicity: NOAEL: >= 125 mg/kg body weight
 Method: OECD Test Guideline 414
 Result: No teratogenic effects

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STOT - single exposure**Components:****2-dimethylaminoethanol:**

Target Organs : Respiratory Tract
 Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation., May cause respiratory irritation.

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:****2-dimethylaminoethanol:**

Species : Rat, male and female
 NOAEL : 150 mg/kg
 Application Route : Oral
 Number of exposures : daily
 Dose : 0/15/50/150 mg/kg bw/d
 Method : OECD Test Guideline 422

Species : Rat, male and female
 NOEC : 87.5 mg/m³
 Application Route : inhalation (vapour)
 Test atmosphere : vapour
 Exposure time : 13 weeks 6 h
 Number of exposures : 5 days/week
 Dose : 8/24/76 ppm
 Method : OECD Test Guideline 413

trientine:

Species : Rat, male and female
 NOAEL : 350 mg/kg
 Application Route : Oral
 Exposure time : 28 d
 Number of exposures : 7 d
 Dose : 100/350/1000 mg/kg bw/day
 Method : OECD Test Guideline 407
 Target Organs : Lungs
 Remarks : Information given is based on data obtained from similar substances.

Species : Dog, male and female
 NOAEL : 125 mg/kg
 Application Route : Oral
 Target Organs : Lungs
 Remarks : Information given is based on data obtained from similar substances.

Species : Dog, male and female
 NOAEL : 50 mg/kg
 Application Route : Oral
 Method : Subchronic toxicity

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

Species : Rat, male and female
 NOAEL : 50 mg/kg
 Application Route : Oral
 Exposure time : 26 weeks
 Dose : 50/175/600 mg/kg bw/day
 Method : OECD Test Guideline 408
 Target Organs : Lungs
 Remarks : Information given is based on data obtained from similar substances.

Species : Mouse, male and female
 NOAEL : 92 mg/kg, 600 ppm
 Application Route : Oral
 Exposure time : 120/600/3000 ppm
 Method : OECD Test Guideline 408
 Remarks : Information given is based on data obtained from similar substances.

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-dimethylaminoethanol:**

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 146.63 mg/l
 End point: mortality
 Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water
 Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 98.37 mg/l
 End point: Immobilization
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water

Toxicity to algae/aquatic : EC50 (Desmodesmus subspicatus (green algae)): 66.08 mg/l

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- plants Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
- EC10 (Desmodesmus subspicatus (green algae)): 24.49 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
- Toxicity to microorganisms : EC20 (activated sludge): > 1,000 mg/l
 Exposure time: 30 min
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 209
 Remarks: Information given is based on data obtained from similar substances.
- trientine:**
- Toxicity to fish : LC50 (Poecilia reticulata (guppy)): 570 mg/l
 Exposure time: 96 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.1.
- LC50 (Leuciscus idus (Golden orfe)): 200 - 500 mg/l
 Exposure time: 96 h
- LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
 End point: mortality
 Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water
 Method: Fish Acute Toxicity Test
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.1 mg/l
 End point: Immobilization
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.2.
- Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l
 Exposure time: 72 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
- EC10 (Selenastrum capricornutum (green algae)): 1.34 mg/l
 Exposure time: 72 h
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Daphnia magna (Water flea)): 1.9 mg/l
 Exposure time: 21 d
 Test Type: semi-static test

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Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to microorganisms : NOEC (Bacteria): ≥ 100 mg/l
Exposure time: 28 d
Method: OECD Test Guideline 216

EC50 (Bacteria): > 100 mg/l
Exposure time: 28 h
Method: OECD Test Guideline 216

EC50 (Bacteria): 15.7 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

NOEC (Bacteria): 1.3 mg/l
Exposure time: 2 h
Test Type: static test
Test substance: Fresh water

Toxicity to soil dwelling organisms : NOEC (Eisenia fetida (earthworms)): ca. 62.5 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

Ecotoxicology Assessment

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

Persistence and degradability**Components:****Formaldehyde, reaction products with hexahydro-1,3-isobenzofurandione and triethylenetetramine:**

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 15 %
Exposure time: 29 d
Method: OECD Test Guideline 301B

2-dimethylaminoethanol:

Biodegradability : aerobic
Inoculum: Mixture
Result: Readily biodegradable.
Biodegradation: 60.5 %
Exposure time: 14 d
Method: OECD Test Guideline 301C
Test substance: Fresh water

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trientine:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 162 d
Method: OECD Test Guideline 301D
Test substance: Fresh water

aerobic
Inoculum: activated sludge
Dissolved organic carbon (DOC)
Result: Not inherently biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: OECD Test Guideline 302A
Test substance: Fresh water

Bioaccumulative potential**Components:****2-dimethylaminoethanol:**

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 3.16
Test substance: Fresh water
GLP: no

Partition coefficient: n-octanol/water : log Pow: -0.55 (73 °F / 23 °C)

trientine:

Partition coefficient: n-octanol/water : log Pow: -2.08 - 2.90 (68 °F / 20 °C)
Method: QSAR

Mobility in soil**Components:****trientine:**

Distribution among environmental compartments : Koc: 3162.28, log Koc: 3.5
Method: OECD Test Guideline 106

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).

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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.
Do not burn, or use a cutting torch on, the empty drum.

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

- UN/ID No. : UN 2735
Proper shipping name : Amines, liquid, corrosive, n.o.s.
(2-DIMETHYLAMINOETHANOL)
Class : 8
Packing group : II
Labels : Corrosive
Packing instruction (cargo aircraft) : 855
Packing instruction (passenger aircraft) : 851

IMDG-Code

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

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

Not applicable for product as supplied.

National Regulations**49 CFR**

- UN/ID/NA number : UN 2735
Proper shipping name : Amines, liquid, corrosive, n.o.s.
(2-DIMETHYLAMINOETHANOL)
Class : 8
Packing group : II
Labels : CORROSIVE
ERG Code : 153
Marine pollutant : no

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Special precautions for user

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

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

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

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
 Skin corrosion or irritation
 Serious eye damage or eye irritation
 Respiratory or skin sensitisation
 Specific target organ toxicity (single or repeated exposure)

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

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

California Prop. 65

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

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

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

Inventories

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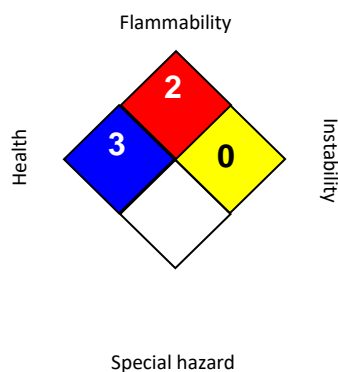
AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

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.

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

HEALTH		3
FLAMMABILITY		2
PHYSICAL HAZARD		0

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

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The 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,

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toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1652 A US

Manufacturer or supplier's detailsCompany name of supplier : Huntsman Advanced Materials Americas LLC
Address : P.O. Box 4980The Woodlands,
TX 77387
United States of America (USA)

Telephone : Non-Emergency: (800) 257-5547

E-mail address : Global_Product_EHS_AdMat@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Epoxy constituents

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

Skin irritation : Category 2

Eye irritation : Category 2A

Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 2

Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.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 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P337 + P313 If eye irritation persists: Get medical advice/ attention.
 P362 Take off contaminated clothing and wash before reuse.
 P391 Collect spillage.
Storage:
 Not available
Disposal:
 P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3	30 - 50
Phenol, polymer with formaldehyde, glycidyl ether	28064-14-4	20 - 30
Glass, oxide, chemicals	65997-17-3	20 - 30
mica	12001-26-2	1 - 5
silicic acid, calcium salt	1344-95-2	1 - 5
silicon dioxide	7631-86-9	0.1 - 1
crystalobalite	14464-46-1	0.1 - 1

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

SECTION 5. FIREFIGHTING MEASURES

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

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- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Carbon oxides
Halogenated compounds
Carbon dioxide (CO₂)
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 fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national

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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
mica	12001-26-2	TWA (Respirable particulate matter)	0.1 mg/m3	ACGIH
		TWA (Dust)	20 Million particles per cubic foot	OSHA Z-3
		TWA (Respirable)	3 mg/m3	NIOSH REL
		TWA (respirable dust fraction)	3 mg/m3	OSHA P0
silicic acid, calcium salt	1344-95-2	TWA (total dust)	15 mg/m3	OSHA Z-1
		TWA (respirable fraction)	5 mg/m3	OSHA Z-1
		TWA (Respirable)	5 mg/m3	NIOSH REL
		TWA (total)	10 mg/m3	NIOSH REL
		TWA (Total dust)	15 mg/m3	OSHA P0
		TWA (respirable dust fraction)	5 mg/m3	OSHA P0
silicon dioxide	7631-86-9	TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m3 /	OSHA Z-3

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			%SiO ₂ (Silica)	
		TWA (Respirable dust)	0.05 mg/m ³ (Silica)	NIOSH REL
		TWA	6 mg/m ³ (Silica)	NIOSH REL
		PEL (respirable)	0.05 mg/m ³	OSHA CARC
cristobalite	14464-46-1	TWA (Respirable particulate matter)	0.025 mg/m ³ (Silica)	ACGIH
		TWA (Respirable dust)	0.05 mg/m ³	OSHA Z-1
		TWA (Respirable dust)	0.05 mg/m ³ (Silica)	NIOSH REL
		TWA (respirable dust fraction)	0.05 mg/m ³	OSHA P0
		PEL (respirable)	0.05 mg/m ³	OSHA CARC

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material : butyl-rubber
 Break through time : > 8 h

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

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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	: white
Odour	: slight
Odour Threshold	: No data is available on the product itself.
pH	: substance/mixture is non-soluble (in water)
Melting point/freezing point	: No data is available on the product itself.
Boiling point	: No data is available on the product itself.
Flash point	: 289 °F / 143 °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	: < 1 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	: 0.7 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.

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Partition coefficient: n-octanol/water : No data is available on the product itself.
Auto-ignition temperature : No data is available on the product itself.
Decomposition temperature : > 392 °F / > 200 °C
Self-Accelerating decomposition temperature (SADT) : No data is available on the product itself.
Viscosity : No data is available on the product itself.
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**Acute toxicity****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

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Assessment: The substance or mixture has no acute dermal toxicity

Phenol, polymer with formaldehyde, glycidyl ether:

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
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

silicon dioxide:

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

Acute inhalation toxicity : LC50 (Rat, male and female): > 58.8 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg

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.

Phenol, polymer with formaldehyde, glycidyl ether:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Irritating to skin.

Glass, oxide, chemicals:

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

silicon dioxide:

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

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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

Phenol, polymer with formaldehyde, glycidyl ether:

Species : Rabbit
Result : Irritating to eyes.
Method : OECD Test Guideline 405

silicon dioxide:

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

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

Test Type : Local lymph node assay (LLNA)
Exposure routes : Skin
Species : Mouse
Method : OECD Test Guideline 429
Result : The product is a skin sensitiser, sub-category 1B.

Phenol, polymer with formaldehyde, glycidyl ether:

Exposure routes : Skin
Species : Mouse
Method : OECD Test Guideline 429
Result : May cause sensitisation by skin contact.

Glass, oxide, chemicals:

Exposure routes : Skin
Species : Other
Result : Does not cause skin sensitisation.

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

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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

Phenol, polymer with formaldehyde, glycidyl ether:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Result: positive

Concentration: 0 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Result: positive

Genotoxicity in vivo : Cell type: Germ
Application Route: Oral
Result: negative

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

silicic acid, calcium salt:

Genotoxicity in vitro : Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Test Type: Chromosome aberration test in vitro
Species: Rat
Method: OECD Test Guideline 475
Result: negative

Test Type: dominant lethal test
Species: Rat (male and female)
Method: OECD Test Guideline 478
Result: negative

silicon dioxide:

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Genotoxicity in vitro : 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

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

Genotoxicity in vivo : Application Route: Inhalation
 Dose: 50 mg/m³
 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
 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

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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

Phenol, polymer with formaldehyde, glycidyl ether:

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

Species : Mouse, male
 Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : .1 mg/kg
 Frequency of Treatment : 3 daily
 Method : OECD Test Guideline 453
 Result : negative

Species : Rat, female
 Application Route : Dermal
 Exposure time : 24 month(s)
 Dose : 1 mg/kg
 Frequency of Treatment : 5 daily
 Method : OECD Test Guideline 453
 Result : negative

silicon dioxide:

Species : Rat, male and female
 Application Route : Oral
 Exposure time : 103 weeks
 Dose : 1800 - 3200 mg/kg
 Frequency of Treatment : 7 daily
 Method : OECD Test Guideline 453
 Result : negative

IARC

Group 1: Carcinogenic to humans silicon dioxide (Silica dust, crystalline)	7631-86-9
Group 1: Carcinogenic to humans cristobalite (Silica dust, crystalline)	14464-46-1

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	Group 2A: Probably carcinogenic to humans Glass, oxide, chemicals (glass)	65997-17-3
	Group 2B: Possibly carcinogenic to humans Glass, oxide, chemicals (special-purpose fibres)	65997-17-3
OSHA	OSHA specifically regulated carcinogen silicon dioxide (crystalline silica)	7631-86-9
	OSHA specifically regulated carcinogen cristobalite (crystalline silica)	14464-46-1
NTP	Known to be human carcinogen silicon dioxide (Silica, Crystalline (Respirable Size))	7631-86-9
	Known to be human carcinogen cristobalite (Silica, Crystalline (Respirable Size))	14464-46-1

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: 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

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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

Phenol, polymer with formaldehyde, glycidyl ether:

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

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

silicic acid, calcium salt:

Effects on foetal development : Species: Rat, male and female
Dose: 0, 16, 74, 350 and 1600 mg/(k
General Toxicity Maternal: NOAEL: 1,600 mg/kg body weight
Embryo-foetal toxicity: NOAEL: 1,600 mg/kg body weight
Method: OECD Test Guideline 414

silicon dioxide:

Effects on foetal development : Species: Mouse
Application Route: Oral
General Toxicity Maternal: NOAEL: 1,340 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

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Species: Rabbit
Application Route: Oral
General Toxicity Maternal: NOAEL: 1,600 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat
Application Route: Oral
General Toxicity Maternal: NOAEL: 1,350 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
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

Phenol, polymer with formaldehyde, glycidyl ether:

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

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NOEL : 10 mg/kg
 Application Route : Skin contact
 Exposure time : 13 Weeks
 Number of exposures : 5 d
 Method : Subchronic toxicity

Species : Mouse, male
 NOAEL : 100 mg/kg
 Application Route : Skin contact
 Exposure time : 13 Weeks
 Number of exposures : 3 d
 Method : Subchronic toxicity

Glass, oxide, chemicals:

Species : Rat, male
 LOEC : 2.4 mg/m³
 Test atmosphere : dust/mist
 Exposure time : 2,160 h
 Number of exposures : 6 h
 Method : Directive 67/548/EEC, Annex, B.29

silicic acid, calcium salt:

Species : Rat, male and female
 : 2500 mg/kg
 Application Route : Oral
 Method : OECD Test Guideline 452

silicon dioxide:

Species : Rat, male and female
 NOEC : 4000 - 4500 mg/m³
 Application Route : Ingestion
 Test atmosphere : dust/mist
 Exposure time : 13 Weeks
 Number of exposures : 7 d
 Method : OECD Test Guideline 413

crystalite:

Species : Rat
 LOEC : 25.9 mg/m³
 Test atmosphere : dust/mist
 Exposure time : 192 h
 Number of exposures : 6 h

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

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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
(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.

Phenol, polymer with formaldehyde, glycidyl ether:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

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- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.7 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202
- EC50 (Daphnia magna (Water flea)): 2.7 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
- Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 9.4 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
- Toxicity to fish (Chronic toxicity) : GLP: yes
- 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
- Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Glass, oxide, chemicals:

- Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l
Exposure time: 96 h
Test Type: Other guidelines
Test substance: Fresh water
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 72 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test Type: semi-static test
Method: OECD Test Guideline 201

silicic acid, calcium salt:

- Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): > 1,000 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

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Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Desmodesmus subspicatus (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201

silicon dioxide:

Toxicity to fish : LL50 (Brachydanio rerio (zebrafish)): > 10,000 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): >= 1,000 mg/l
Exposure time: 24 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

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

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Phenol, polymer with formaldehyde, glycidyl ether:

Biodegradability : Inoculum: Sewage (STP effluent)
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

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

Phenol, polymer with formaldehyde, glycidyl ether:

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

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

Distribution among environmental compartments : Koc: 445

Phenol, polymer with formaldehyde, glycidyl ether:

Distribution among environmental compartments : Koc: 445

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

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

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

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

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(BISPHENOL A EPOXY RESIN, EPOXY PHENOL NOVOLAC 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, EPOXY PHENOL NOVOLAC 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**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
1-chloro-2,3-epoxypropane	106-89-8	100	

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

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

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

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California Prop. 65

WARNING: This product can expose you to chemicals including cristobalite, 2,3-Epoxypropyl phenyl ether, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

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

DSL	: All components of this product are on the Canadian DSL
AIIC	: On the inventory, or in compliance with the inventory
NZIoC	: Not 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.

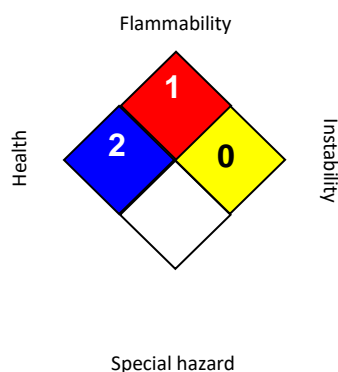
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

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:**

HEALTH		2
FLAMMABILITY		1
PHYSICAL HAZARD		0

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

Revision Date	:	07/19/2022
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA CARC	:	OSHA Specifically Regulated Chemicals/Carcinogens
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
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 CARC / PEL	:	Permissible exposure limit (PEL)
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.

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.

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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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