

EPOCAST® 1617 B US

Version 1.1 Revision Date: 11/15/2016 SDS Number: 400001009216 Date of last issue: 08/20/2015
Date of first issue: 08/20/2015

SECTION 1. IDENTIFICATION

Product name : EPOCAST® 1617 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 of person responsible for the SDS : MSDS@huntsman.com
Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Hardener

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

Acute toxicity (Inhalation) : Category 3
Skin corrosion : Category 1B
Serious eye damage : Category 1
Skin sensitisation : Category 1
Reproductive toxicity : Category 2
Acute aquatic toxicity : Category 2
Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H331 Toxic if inhaled.
H361d Suspected of damaging the unborn child.
H411 Toxic to aquatic life with long lasting effects.

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Precautionary statements : **Prevention:**
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P272 Contaminated work clothing should not be allowed out of the workplace.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
 P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
 P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
 P308 + P313 IF exposed or concerned: Get medical advice/ attention.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P363 Wash contaminated clothing before reuse.
 P391 Collect spillage.

Storage:
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.

Disposal:
 P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity:
 26.8997 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine	68082-29-1	30 - 60
2,2'-iminodi(ethylamine)	111-40-0	13 - 30
triethylenetetramine	112-24-3	3 - 7

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Silicon, amorphous	112945-52-5	1 - 3
Aminoethylpiperazine	140-31-8	0.1 - 1

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

SECTION 4. FIRST AID MEASURES

- General advice : No hazards which require special first aid measures.
- If inhaled : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion.
If symptoms persist, call a physician.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
- In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : None known.
- Notes to physician : No information available.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : No data is available on the product itself.
- Specific extinguishing methods : No data is available on the product itself.
- Further information : Standard procedure for chemical fires.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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Personal precautions, protective equipment and emergency procedures : Not applicable for product as supplied.

Environmental precautions : No special environmental precautions required.

Methods and materials for containment and cleaning up : Wipe up with absorbent material (e.g. cloth, fleece).
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 : For personal protection see section 8.
No special handling advice required.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.

Materials to avoid : Strong acids
Strong bases
Strong oxidizing agents

No special restrictions on storage with other products.

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

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2,2'-iminodi(ethylamine)	111-40-0	TWA	1 ppm	ACGIH
Silicon, amorphous	112945-52-5	TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m ³ / %SiO ₂ (Silica)	OSHA Z-3

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

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

Solvent-resistant gloves (butyl-rubber)
Nitrile rubber

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10 - 480 min

Remarks : For prolonged or repeated contact use protective gloves.

Eye protection : Safety glasses

Skin and body protection : Protective suit

Hygiene measures : General industrial hygiene practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : amber

Odour : amine-like

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

pH : No data is available on the product itself.

Melting point/freezing point : No data available

Initial boiling point and boiling range : No data available

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

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

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

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

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

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

Vapour pressure : < 1 hPa (20 °C)

Relative vapour density : No data is available on the product itself.

Relative density : No data is available on the product itself.

Density : ca. 1 g/cm³ (25 °C)

Solubility(ies)
Water solubility : partly soluble (20 °C)

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

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

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

Thermal decomposition : No data is available on the product itself.

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

Viscosity
Viscosity, dynamic : 15,000 mPa.s (25 °C)

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

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

Molecular weight : No data available

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

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable under recommended storage conditions.

Chemical stability : No decomposition if stored and applied as directed.

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

Conditions to avoid : No data available

Incompatible materials : No data available

Hazardous decomposition products : Carbon oxides
Nitrogen oxides (NOx)
Burning produces noxious and toxic fumes.

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

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

Acute inhalation toxicity - Product : Acute toxicity estimate: 0.88 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : 3,888 mg/kg
Method: Calculation method

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

Skin corrosion/irritation**Product:**

Remarks: The product is not considered as being a skin irritant.

Serious eye damage/eye irritation**Product:**

Remarks: According to the classification criteria of the European Union, the product is not considered as being an eye irritant.

Respiratory or skin sensitisation**Product:**

Remarks: No data available

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Assessment: May cause an allergic skin reaction.

Germ cell mutagenicity**Components:**

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Species: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Micronucleus test
Species: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

Test Type: Ames test
Species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

triethylenetetramine:
Genotoxicity in vitro

: Concentration: 0 - 200 µg/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

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Silicon, amorphous:
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

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

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

Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Components:

2,2'-iminodi(ethylamine):
Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Dose: 85 - 850 mg/kg
Method: OECD Test Guideline 474
Result: negative

Application Route: Oral
Result: negative

triethylenetetramine:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

Silicon, amorphous:
Genotoxicity in vivo : Application Route: Inhalation
Dose: 50 mg/m3
Result: negative

Aminoethylpiperazine:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

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Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Germ cell mutagenicity-
Assessment : In vitro tests did not show mutagenic effects

Germ cell mutagenicity-
Assessment : No data available

Carcinogenicity**Components:**

2,2'-iminodi(ethylamine):

Species: Mouse, (male)

Application Route: Dermal

Dose: 56.3 mg/kg

Frequency of Treatment: 3 daily

Result: negative

triethylenetetramine:

Species: Mouse, (male)

Application Route: Dermal

Dose: 42 mg/kg

Frequency of Treatment: 3 days/week

Method: OECD Test Guideline 451

Result: negative

Species: Mouse, (male)

Application Route: Dermal

Exposure time: 104 weeks

Dose: 16.8 mg/kg

Frequency of Treatment: 3 days/week

Method: OECD Test Guideline 451

Silicon, amorphous:

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

Carcinogenicity -
Assessment : No data available

IARC

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

ACGIH

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

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

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:**

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 0, 100, 300, 1000 mg/kg bw/d
Frequency of Treatment: 7 days/week
General Toxicity - Parent: No observed adverse effect level:
1,000 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.

2,2'-iminodi(ethylamine):
Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No observed adverse effect level:
30 mg/kg wet weight
Method: OECD Test Guideline 421

Aminoethylpiperazine:
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: No effects on fertility and early embryonic
development were detected.

Components:

2,2'-iminodi(ethylamine):
Effects on foetal development : Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
100 mg/kg body weight
Method: OECD Test Guideline 421

triethylenetetramine:
Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
> 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level:

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125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Silicon, amorphous:

Species: Mouse
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
1,340 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

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

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
1,350 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Aminoethylpiperazine:

Test Type: Embryo-foetal development
Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
100 mg/kg body weight
Embryo-foetal toxicity: No observed adverse effect level:
1,000 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Fertility/early embryonic development
Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level:
75 mg/kg body weight
Embryo-foetal toxicity: No observed adverse effect level: 75
mg/kg body weight
Method: OECD Test Guideline 414
Result: Teratogenicity and developmental toxicity

Components:

Aminoethylpiperazine:
Reproductive toxicity -
Assessment

: Some evidence of adverse effects on development, based on
animal experiments.

STOT - single exposure**Components:**

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2,2'-iminodi(ethylamine):
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

STOT - repeated exposure**Components:**

Aminoethylpiperazine:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity**Components:**

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:
Species: Rat, male and female
NOAEL: 1000 mg/kg
NOAEL: 1,000 mg/kg
Application Route: Oral
Exposure time: 14 days
Number of exposures: Once daily
Dose: 0, 100, 300, 1000 mg/kg bw/d
Group: yes
Method: OECD Test Guideline 422
Target Organs: Liver

2,2'-iminodi(ethylamine):
Species: Rat, male and female
: 70 - 80 mg/m³
Application Route: Ingestion
Test atmosphere: vapour
Exposure time: 360 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOAEL: 114 mg/kg/d
Application Route: Skin contact
Exposure time: 9,600 h
Number of exposures: 6 d
Method: Chronic toxicity

triethylenetetramine:
Species: Rat, male and female
NOAEL: 50 mg/kg/d
Application Route: Ingestion
Exposure time: 26 Weeks
Number of exposures: 7 d
Method: Subchronic toxicity

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Silicon, amorphous:
Species: Rat, male and female
NOAEL: 7950 - 8980 mg/kg
Application Route: Ingestion
Exposure time: 4,320 h
Number of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
: 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

Aminoethylpiperazine:
Species: Rat, male and female
NOAEL: 152 mg/kg/d
Application Route: Oral
Exposure time: 28 d
Method: OECD Test Guideline 422

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

Species: Rat, male and female
: 0.2 mg/m³
Application Route: Inhalation
Exposure time: 90 d
Number of exposures: 6h/d, 5d/week
Method: OECD Test Guideline 413
Target Organs: Respiratory Tract
Assessment: The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Species: Rat, male and female
: 53.3 mg/m³
Application Route: Inhalation
Exposure time: 90 d
Number of exposures: 6h/d, 5d/week
Method: OECD Test Guideline 413

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Repeated dose toxicity - Assessment : No adverse effect has been observed in chronic toxicity tests.

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Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information**Product:**

Remarks: No data available

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

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 7.07 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

2,2'-iminodi(ethylamine):

Toxicity to fish : LC50: 430 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.

triethylenetetramine:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

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Method: Fish Acute Toxicity Test

Silicon, amorphous:
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

Aminoethylpiperazine:
Toxicity to fish : LC50: 2,190 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 7.07 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

2,2'-iminodi(ethylamine):
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 32 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

triethylenetetramine:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.1 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.

Silicon, amorphous:
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

Aminoethylpiperazine:
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 58 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): 4.34 mg/l

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Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201

EC10 (Selenastrum capricornutum (green algae)): 1.78 mg/l
 Exposure time: 72 h
 Test Type: static test
 Method: OECD Test Guideline 201

2,2'-iminodi(ethylamine):
 Toxicity to algae : EbC50 (Selenastrum capricornutum (green algae)): 1,164 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201

triethylenetetramine:
 Toxicity to algae : 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

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

Aminoethylpiperazine:
 Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l
 Exposure time: 72 h
 Test substance: Fresh water
 Method: OECD Test Guideline 201

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

Components:

2,2'-iminodi(ethylamine):
 Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l
 Exposure time: 28 d
 Test Type: semi-static test
 Test substance: Fresh water
 Method: OECD Test Guideline 210

Components:

2,2'-iminodi(ethylamine):
 Toxicity to daphnia and other aquatic invertebrates : NOEC (Daphnia magna (Water flea)): 5.6 mg/l
 Exposure time: 21 d

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Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Further information

The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 26.8997 %

Persistence and degradability**Components:**

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 - 70 %
Exposure time: 74 d
Method: OECD Test Guideline 301B

2,2'-iminodi(ethylamine):

Biodegradability : Inoculum: activated sludge
Result: Readily biodegradable.
Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D

triethylenetetramine:

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

Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: Inherent Biodegradability: Modified SCAS Test

Aminoethylpiperazine:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Components:

Aminoethylpiperazine:

Biochemical Oxygen Demand (BOD) : 5 mg/l
Incubation time: 5 d

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Components:

Aminoethylpiperazine:
 Chemical Oxygen Demand (COD) : 560 mg/l
 BOD/COD : No data available
 ThOD : No data available
 BOD/ThOD : No data available
 Dissolved organic carbon (DOC) : No data available
 Physico-chemical removability : No data available
 Stability in water : No data available

Components:

2,2'-iminodi(ethylamine):
 Photodegradation : Test Type: Air
 Rate constant: 500000
 Degradation (direct photolysis): 50 %

Aminoethylpiperazine:
 Photodegradation : Test Type: Air
 Degradation (direct photolysis): 50 %
 Test Type: Water

Impact on Sewage Treatment : No data available

Bioaccumulative potential**Components:**

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:
 Bioaccumulation : Bioconcentration factor (BCF): 77.4
 Remarks: Does not bioaccumulate.

2,2'-iminodi(ethylamine):
 Bioaccumulation : Species: Cyprinus carpio (Carp)
 Bioconcentration factor (BCF): 0.3 - 6.3
 Exposure time: 42 d
 Test substance: Fresh water
 Method: flow-through test
 Remarks: Bioaccumulation is unlikely.

Aminoethylpiperazine:
 Bioaccumulation : Species: Fish
 Remarks: Does not bioaccumulate.

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1.1	11/15/2016	400001009216	Date of first issue: 08/20/2015

Components:

Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine:

Partition coefficient: n-octanol/water : log Pow: 10.34
Method: OECD Test Guideline 117

2,2'-iminodi(ethylamine):

Partition coefficient: n-octanol/water : log Pow: -1.58 (20 °C)
pH: 7

triethylenetetramine:

Partition coefficient: n-octanol/water : log Pow: -2.65 (20 °C)
Method: OECD Test Guideline 117

Aminoethylpiperazine:

Partition coefficient: n-octanol/water : log Pow: -1.48 (20 °C)

Mobility in soil

Mobility : No data available

Components:

2,2'-iminodi(ethylamine):

Distribution among environmental compartments : Koc: 19111

triethylenetetramine:

Distribution among environmental compartments : Koc: 1584.9 - 5012
Method: OECD Test Guideline 106

Aminoethylpiperazine:

Distribution among environmental compartments : Koc: ca. 37000

Stability in soil : No data available

Other adverse effects

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer

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

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B).

Additional ecological information - Product : There is no data available for this product.

Global warming potential (GWP) : No data available

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Empty remaining contents.
Empty containers should be taken to an approved waste handling site for recycling or disposal.

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

UN/ID No. : UN 2079

Proper shipping name : Diethylenetriamine , MIXTURE

Class : 8

Packing group : II

Labels : Corrosive

Packing instruction (cargo aircraft) : 855

Packing instruction (passenger aircraft) : 851

IMDG

UN number : UN 2079

Proper shipping name : DIETHYLENETRIAMINE , MIXTURE

Class : 8

Packing group : II

Labels : 8

EmS Code : F-A, S-B

Marine pollutant : yes

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

Not applicable for product as supplied.

National Regulations**DOT Classification**

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UN/ID/NA number	: UN 2079
Proper shipping name	: DIETHYLENETRIAMINE , MIXTURE
Class	: 8
Packing group	: II
Labels	: CORROSIVE
ERG Code	: 154
Marine pollutant	: yes(POLYAMIDE RESIN)

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

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

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

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

California Prop. 65 This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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

CH INV	: The formulation contains substances listed on the Swiss Inventory
TSCA	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
AICS	: 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	: Not in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: Not in compliance with the inventory

Inventories

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

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

No substances are subject to a Significant New Use Rule.

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.

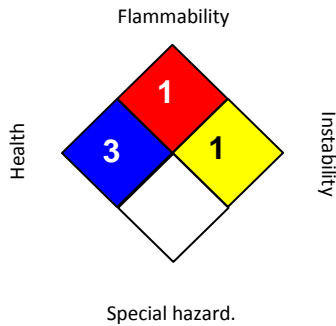
EPOCAST® 1617 B US

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 Date of first issue: 08/20/2015

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS® IV:

HEALTH	*	3
FLAMMABILITY		1
PHYSICAL HAZARD		1

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks.

Revision Date : 11/15/2016

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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Material Safety Data Sheet

EPOCAST® 1617 A US

1 . Product and company identification

Product name : EPOCAST® 1617 A US
Material uses : Resin for adhesive systems
(M)SDS # : 00052740
Validation date : 3/20/2014.
Supplier/Manufacturer : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

E-Mail: MSDS@huntsman.com

In case of emergency : Chemtrec: (800) 424-9300 or (703) 527-3887

2 . Hazards identification

Physical state : Liquid.(Paste)
Odor : Slight
Color : Off-white.
OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview : WARNING!
CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
POSSIBLE CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER, BASED ON ANIMAL DATA.
Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist.
Do not get on skin or clothing. Avoid contact with eyes. Wash thoroughly after handling.

See toxicological information (Section 11)

GENERAL INFORMATION : Read the entire MSDS for a more thorough evaluation of the hazards.

3 . Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Bisphenol A epoxy resin	25068-38-6	30 - 60
1,2-CRESYL GLYCIDYL ETHER	2210-79-9	7 - 13
triphenyl phosphate	115-86-6	3 - 7
antimony trioxide	1309-64-4	3 - 7

4 . First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Notes to physician** : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

5 . Fire-fighting measures

- Flash point** : Closed cup: >135°C (>275°F) [PMCC]
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
phosphorus oxides
halogenated compounds
metal oxide/oxides
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6 . Accidental release measures

- Methods for cleaning up** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
- Engineering measures** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Respiratory** : In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

8 . Exposure controls/personal protection

- Hands** : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL)
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Appearance

- Physical state** : Liquid.(Paste)
- Color** : Off-white.
- Odor** : Slight
- pH** : Not available.
- Boiling/condensation point** : Not available.
- Melting/freezing point** : Not available.
- Flash point** : Closed cup: >135°C (>275°F) [PMCC]
- Flammable limits** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : >200°C (>392°F)
- Vapor pressure** : <0.1 kPa (<0.75 mm Hg) [room temperature]
- Specific gravity** : Not available.
- Water solubility** : practically insoluble
- Partition coefficient: n-octanol/water (log Kow)** : Not available.
- Density** : 0.62 g/cm³ [25°C (77°F)]
- Vapor density** : Not available.
- Evaporation rate (butyl acetate = 1)** : Not available.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : strong acids, strong bases, strong oxidising agents
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
1,2-CRESYL GLYCIDYL ETHER	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Vapor	Rat - Male, Female	>6.1 ppm
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rat - Male, Female	>2000 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	>5000 mg/kg
Bisphenol A epoxy resin	-	LC0 Inhalation Vapor	Rat - Male	0.00001 ppm
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rat - Male, Female	>2000 mg/kg
	OECD 420 Acute Oral Toxicity - Fixed Dose Method	LD50 Oral	Rat - Female	>2000 mg/kg
triphenyl phosphate	-	LD50 Dermal	Rabbit	>7900 mg/kg
	-	LD50 Oral	Mouse	>5000 mg/kg
	-	LD50 Oral	Rat	>3500 mg/kg
antimony trioxide	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.2 mg/l
	-	LD50 Dermal	Rabbit	8300 mg/kg
	-	LD50 Oral	Rat	>20000 mg/g

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
1,2-CRESYL GLYCIDYL ETHER	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Non-irritant.
Bisphenol A epoxy resin	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Mild irritant
antimony trioxide	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Non-irritant.
	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Non-irritant.

Conclusion/Summary

Skin :

11 . Toxicological information

	Bisphenol A epoxy resin	Irritating to skin.
	1,2-CRESYL GLYCIDYL ETHER	Non-irritating to the skin.
	triphenyl phosphate	No additional information.
	antimony trioxide	Non-irritating to the skin.
Eyes	: Bisphenol A epoxy resin	Irritating to eyes.
	1,2-CRESYL GLYCIDYL ETHER	Non-irritating to the eyes.
	triphenyl phosphate	No additional information.
	antimony trioxide	Non-irritating to the eyes.
Respiratory	: Bisphenol A epoxy resin	No additional information.
	1,2-CRESYL GLYCIDYL ETHER	No additional information.
	triphenyl phosphate	No additional information.
	antimony trioxide	No additional information.

Sensitizer

Product/ingredient name	Test	Route of exposure	Species	Result
1,2-CRESYL GLYCIDYL ETHER	OECD 406 Skin Sensitization	skin	Guinea pig	Sensitizing
Bisphenol A epoxy resin	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing
antimony trioxide	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing

Mutagenicity

Product/ingredient name	Test	Result
1,2-CRESYL GLYCIDYL ETHER	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Positive
	Experiment: In vivo Subject: Mammalian-Animal	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Equivocal
Bisphenol A epoxy resin	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Positive
	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/-	Positive
	Experiment: In vivo Subject: Mammalian-Animal Cell: Germ	Negative
	Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic	Negative

Conclusion/ Summary : antimony trioxide Not mutagenic in a standard battery of genetic toxicological tests.

11 . Toxicological information

Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Bisphenol A epoxy resin	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	15 mg/kg	2 years; 7 days per week	Negative - Oral - NOAEL
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Female	1 mg/kg	2 years; 5 days per week	Negative - Dermal - NOEL
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Mouse - Male	0.1 mg/kg	2 years; 3 days per week	Negative - Dermal - NOEL
antimony trioxide	OECD 451 Carcinogenicity Studies	Rat - Female	45 mg/m ³	1 years; 7 hours per day	Positive - Inhalation - LOAEL

Carcinogenic class

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
triphenyl phosphate	A4	-	-	-	-	-
antimony trioxide	A2	2B	-	-	-	-

Reproductive toxicity

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
Bisphenol A epoxy resin	OECD 416 Two- Generation Reproduction Toxicity Study	Rat - Male, Female	Negative	Negative	Negative
antimony trioxide	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat - Male, Female	-	Negative	-

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
Bisphenol A epoxy resin	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Oral
	EPA CFR OECD 414 Prenatal Developmental Toxicity Study	Rabbit - Female Rabbit - Female	Negative - Dermal Negative - Oral
antimony trioxide	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation

11 . Toxicological information

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.
Skin contact : Irritating to skin. May cause sensitization by skin contact.
Eye contact : Irritating to eyes.

Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
1,2-CRESYL GLYCIDYL ETHER	OECD 412 Repeated Dose Inhalation Toxicity: 28-day or 14-day Study	Sub-acute NOEC Inhalation Vapor	Rat - Male, Female	>4 ppm
Bisphenol A epoxy resin	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	50 mg/kg
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOEL Dermal	Rat - Male, Female	10 mg/kg
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOAEL Dermal	Mouse - Male	100 mg/kg
antimony trioxide	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	1686 to 1879 mg/kg
	OECD 452 Chronic Toxicity Studies	Chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	>0.51 mg/m ³

- General** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Target organs** : No known significant effects or critical hazards.
- Carcinogenicity** : Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Medical conditions aggravated by over-exposure**

Pre-existing skin disorders may be aggravated by over-exposure to this product.

12 . Ecological information

Environmental effects : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Water polluting material. May be harmful to the environment if released in large quantities.

Aquatic ecotoxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result	
Bisphenol A epoxy resin	EPA CFR	Acute	EC50	72 hours Static	Algae	9.4 mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	1.7 mg/l
	Unknown guidelines	Acute	IC50	3 hours Static	Bacteria	>100 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	1.5 mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days Semi- static	Daphnia	0.3 mg/l
1,2-CRESYL GLYCIDYL ETHER	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	5.1 mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	3.3 mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute	IC50	3 hours Static	Bacteria	>100 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	6.5 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	2.8 to 5.1 mg/l
triphenyl phosphate	-	Acute	EC50	48 hours	Daphnia	1.35 mg/l
	-	Acute	LC50	96 hours	Fish	0.66 mg/l
	-	Acute	LC50	96 hours	Fish	0.36 to 0. 85 mg/l
	-	Acute	LC50	96 hours	Fish	0.78 mg/l
	-	Chronic	NOEC	72 hours	Algae	0.25 to 2. 5 mg/l
	-	Chronic	NOEC	30 days Flow- through	Fish	0.04 mg/l
antimony trioxide	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	>36.6 mg/l
	Unknown guidelines	Acute	LC50	96 hours Static	Daphnia	1.77 mg/l
	Unknown guidelines	Acute	LC50	96 hours Static	Fish	14.4 mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days Semi- static	Daphnia	1.74 mg/l
	Unknown guidelines	Chronic	NOEC	28 days Flow- through	Fish	1.13 mg/l

Persistence and degradability

12 . Ecological information

Product/ingredient name	Test	Period	Result
Bisphenol A epoxy resin	OECD Derived from OECD 301F (Biodegradation Test)	28 days	5 %
1,2-CRESYL GLYCIDYL ETHER	OECD 301B Ready Biodegradability - CO ₂ Evolution Test	28 days	11 to 17 %
triphenyl phosphate	-	28 days	>60 %

Conclusion/Summary : Bisphenol A epoxy resin Not readily biodegradable.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Bisphenol A epoxy resin	Fresh water 4.83 days Fresh water 3.58 days	-	Not readily
1,2-CRESYL GLYCIDYL ETHER	Fresh water 7.1 days Fresh water 0.44 days Fresh water 0.39 days	-	Not readily
triphenyl phosphate	Fresh water 0.37 days -	-	Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Bisphenol A epoxy resin	3.242	31	low
1,2-CRESYL GLYCIDYL ETHER	2.5	-	low
triphenyl phosphate	4.59 to 4.76	132	low

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

BOD5 : Not Determined
COD : Not Determined
TOC : Not Determined

13 . Disposal considerations

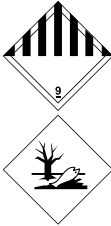
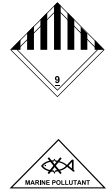
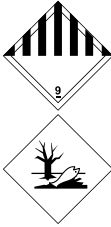
Waste disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.


14 . Transport information

Proper shipping name

- DOT** : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, TRIPHENYL PHOSPHATE) Marine pollutant
- TDG** : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, TRIPHENYL PHOSPHATE) Marine pollutant
- IMDG** : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, TRIPHENYL PHOSPHATE) Marine pollutant
- IATA** : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, TRIPHENYL PHOSPHATE)

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN3082	9	III		Marine pollutants are only regulated for bulk and vessel shipments, per 49CFR171.4 (c) Exceptions. Except when all or part of the transportation is by vessel, the requirements of this subchapter specific to marine pollutants do not apply to non-bulk packagings transported by motor vehicle, rail car or aircraft.
TDG Classification	UN3082	9	III		-
IMDG Class	UN3082	9	III		Emergency schedules (EmS) F-A S-F

14 . Transport information

IATA-DGR Class	UN3082	9	III		<u>Passenger and Cargo Aircraft</u> Quantity limitation: 450 L Packaging instructions: 964 <u>Cargo Aircraft Only</u> Quantity limitation: 450 L Packaging instructions: 964
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PG* : Packing group

15 . Regulatory information**United States**

HCS Classification : Irritating material
Sensitizing material
Carcinogen

U.S. Federal regulations

TSCA 8(b) inventory : **United States inventory (TSCA 8b)**: All components are listed or exempted.
TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

TSCA 5(e) substance consent order : No ingredients listed.

TSCA 12(b) export notification : No ingredients listed.

SARA 311/312 : Immediate (acute) health hazard
Delayed (chronic) health hazard

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration %</u>
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	antimony trioxide	1309-64-4	3.9977
	Glass oxide	65997-17-3	23.862

Clean Air Act - Ozone Depleting Substances (ODS) : This product does not contain nor is it manufactured with ozone depleting substances.

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration %</u>
SARA 313 Form R - Reporting requirements	antimony trioxide	1309-64-4	3.9977

CERCLA Hazardous substances :

Components	Concentration %	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity (Lbs)	Product Reportable Quantity (Lbs)
antimony trioxide	3 - 7	Listed	1000	25014

15 . Regulatory information

State regulations

PENNSYLVANIA - RTK : triphenyl phosphate, antimony trioxide

California Prop 65 : **WARNING:**This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>
antimony trioxide	Yes.	No.
arsenic	Yes.	No.
lead	Yes.	Yes.

International regulations

Canada

WHMIS (Canada) : Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

CEPA DSL : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the **Controlled Products Regulations** and the **MSDS** contains all the information required by the **Controlled Products Regulations**.

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): Not determined.

16 . Other information

Label requirements : CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. POSSIBLE CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		1
Physical hazards		0
Personal protection		

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



16 . Other information

Date of printing : 3/20/2014.

Date of issue : 3/20/2014.

Date of previous issue : 3/13/2013.

Version : 8

✔ Indicates information that has changed from previously issued version.

Notice to reader

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

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

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

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