

SAFETY DATA SHEET

EPOCAST® 50-A1 US

Section 1. Identification

GHS product identifier : EPOCAST® 50-A1 US
Product code : 00051756
Other means of identification : Not available.
Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Resin for adhesive systems

Supplier's details : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

e-mail address of person responsible for this SDS : MSDS@huntsman.com

Emergency telephone number (24h/7day) : Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
TOXIC TO REPRODUCTION [Fertility] - Category 2
TOXIC TO REPRODUCTION [Unborn child] - Category 2
AQUATIC HAZARD (ACUTE) - Category 2
AQUATIC HAZARD (LONG-TERM) - Category 2
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 12%
Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 12%

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements :

Section 2. Hazards identification

Causes serious eye irritation.
Causes skin irritation.
May cause an allergic skin reaction.
Suspected of damaging fertility or the unborn child.
Toxic to aquatic life with long lasting effects.

Precautionary statements : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves: > 8 hours (breakthrough time): Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber. Wear eye or face protection. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Collect spillage. IF exposed or concerned: Get medical attention. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

| Ingredient name | % | CAS number |
|----------------------------|---------|-------------|
| Bisphenol A epoxy resin | 30 - 60 | 25068-38-6 |
| Epoxy phenol novolac resin | 30 - 60 | 28064-14-4 |
| silsesquioxane | 7 - 13 | 181186-39-0 |
| tricresyl phosphate | 7 - 13 | 1330-78-5 |
| Nonylphenol | 0.1 - 1 | 84852-15-3 |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation. May cause an allergic skin reaction.
- Ingestion** : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.
- Protection of first-aiders** : 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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)



Section 5. Fire-fighting measures

- Flash point** : Closed cup: >95°C (>203°F)
- Extinguishing media**
- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.
- Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
phosphorus oxides
halogenated compounds
- Special protective actions for fire-fighters** : 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.
- 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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : 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.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- 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. Collect spillage.
- Methods and materials for containment and 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.



Section 6. Accidental release measures

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. 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.
- Advice on general occupational hygiene** : 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. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : 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. Store locked up. 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.

Section 8. Exposure controls/personal protection

Control parameters

- Appropriate engineering controls** : 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.
- 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.

Individual protection measures

- 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.
- Eye/face protection** : 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.



Section 8. Exposure controls/personal protection

- Hand protection** : 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): Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber
- Body protection** : 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.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. 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.
- Thermal hazards** : Not available.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Liquid.
- Color** : Light yellow
- Odor** : Slight
- Odor threshold** : Not available.
- pH** : Not available.
- Melting point/Freezing point** : Not available.
- Boiling/condensation point** : >200°C (>392°F)
- Flash point** : Closed cup: >95°C (>203°F)
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : <0.15 kPa (<1.125 mm Hg) [room temperature]
- Vapor density** : Not available.
- Relative density** : 1.21
- Solubility in water** : partially soluble
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : >200°C (>392°F)
- Density** : 1.2 g/cm³ [25°C (77°F)]
- Viscosity** : Kinematic (room temperature): 77.7 cm²/s (7770 cSt)



Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

| Product/ingredient name | Test | Endpoint | Species | Result |
|----------------------------|--|--|--|---|
| Bisphenol A epoxy resin | - OECD 420 Acute Oral Toxicity - Fixed Dose Method | LC0 Inhalation Vapor LD50 Oral | Rat - Male Rat - Female | 0.00001 ppm >2000 mg/kg |
| Epoxy phenol novolac resin | - OECD 402 Acute Dermal Toxicity OECD 420 Acute Oral Toxicity - Fixed Dose Method | LC0 Inhalation Vapor LD50 Dermal LD50 Oral | Rat - Male Rat - Male, Female Rat - Female | 0.00001 ppm >2000 mg/kg >2000 mg/kg |
| tricresyl phosphate | - | LC50 Inhalation Dusts and mists LD50 Oral | Rat | >11.1 mg/l |
| Nonylphenol | - Unknown guidelines | LD50 Oral | Rat Rat - Male, Female | >20000 mg/kg 1412 mg/kg |

Irritation/Corrosion

| Product/ingredient name | Test | Species | Result |
|----------------------------|--|---------|----------------------|
| Bisphenol A epoxy resin | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin - Mild irritant |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes - Mild irritant |
| Epoxy phenol novolac resin | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes - Mild irritant |
| | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin - Mild irritant |
| tricresyl phosphate | - | Rabbit | Skin - Non-irritant. |
| | - | Rabbit | Eyes - Non-irritant. |

Conclusion/Summary

Skin :

Section 11. Toxicological information

Bisphenol A epoxy resin Irritating to skin.
 Epoxy phenol novolac resin Slightly irritating to the skin.
 silsesquioxane No additional information.
 tricresyl phosphate Non-irritating to the skin.
 Nonylphenol No additional information.

Eyes :

Bisphenol A epoxy resin Irritating to eyes.
 Epoxy phenol novolac resin Slightly irritating to the eyes.
 silsesquioxane No additional information.
 tricresyl phosphate Non-irritating to the eyes.
 Nonylphenol No additional information.

Respiratory :

Bisphenol A epoxy resin No additional information.
 Epoxy phenol novolac resin No additional information.
 silsesquioxane No additional information.
 tricresyl phosphate No additional information.
 Nonylphenol No additional information.

Sensitization

| Product/ingredient name | Test | Route of exposure | Species | Result |
|----------------------------|--|-------------------|---------------------|------------------------------------|
| Bisphenol A epoxy resin | OECD 429 Skin Sensitization: Local Lymph Node Assay | skin | Mouse | Sensitizing |
| Epoxy phenol novolac resin | OECD 429 Skin Sensitization: Local Lymph Node Assay | skin | Mouse | Sensitizing |
| tricresyl phosphate | OECD 429 Skin Sensitization: Local Lymph Node Assay | skin | Mouse | Ambiguous |
| Nonylphenol | - OECD 406 Skin Sensitization | skin skin | Other Guinea pig | Not sensitizing Not sensitizing |

Mutagenicity

| Product/ingredient name | Test | Result |
|----------------------------|--|--|
| Bisphenol A epoxy resin | Experiment: In vitro Subject: Bacteria Metabolic activation: +/- Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/- Experiment: In vivo Subject: Mammalian-Animal Cell: Germ Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic | Positive Positive Negative Negative |
| Epoxy phenol novolac resin | Experiment: In vitro Subject: Bacteria Metabolic activation: +/- Experiment: In vitro | Positive Positive |

Section 11. Toxicological information

| | | |
|---------------------|--|----------|
| tricresyl phosphate | Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/- Experiment: In vivo | Negative |
| | Subject: Mammalian-Animal Cell: Germ Experiment: In vivo | Negative |
| | Subject: Mammalian-Animal Cell: Somatic Experiment: In vitro | Negative |
| | Subject: Bacteria Metabolic activation: +/- Experiment: In vitro | Negative |
| | Subject: Mammalian-Animal Metabolic activation: +/- Experiment: In vitro | Negative |
| | Subject: Mammalian-Animal Metabolic activation: +/- | |

Conclusion/Summary :

Epoxy phenol novolac resin The weight of the scientific evidence indicates that this material is non-genotoxic.

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 |
| Epoxy phenol novolac 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 | Mouse - Male | 0.1 mg/kg | 2 years; 3 | Negative - Dermal - |

Section 11. Toxicological information

| | | | | | |
|--|--|--|--|---------------|------|
| | Combined Chronic Toxicity/ Carcinogenicity Studies | | | days per week | NOEL |
|--|--|--|--|---------------|------|

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 |
| Epoxy phenol novolac resin | OECD 416 Two-Generation Reproduction Toxicity Study | Rat - Male, Female | Negative | Negative | - |
| tricresyl phosphate | OECD 415 One-Generation Reproduction Toxicity Study | Rat - Male, Female | Positive | Positive | Positive |

Conclusion/Summary :

tricresyl phosphate Reproductive toxin

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 | Rabbit - Female | Negative - Dermal |
| | OECD 414 Prenatal Developmental Toxicity Study | Rabbit - Female | Negative - Oral |
| Epoxy phenol novolac resin | OECD 414 Prenatal Developmental Toxicity Study | Rat - Female | Negative - Oral |
| | - | Rabbit - Female | Negative - Dermal |
| | OECD 414 Prenatal Developmental Toxicity Study | Rabbit - Female | Negative - Oral |
| tricresyl phosphate | EPA OPPTS | Rat - Female | Positive - Oral |
| Nonylphenol | OECD 414 Prenatal Developmental Toxicity Study | Rat - Female | Negative - Oral |

Conclusion/Summary :

tricresyl phosphate May cause harm to the unborn child.

Specific target organ toxicity (single exposure)

| Product/ingredient name | Category | Route of exposure | Target organs |
|-------------------------|------------|-------------------|------------------------------|
| tricresyl phosphate | Category 3 | Not applicable. | Respiratory tract irritation |

Specific target organ toxicity (repeated exposure)



Section 11. Toxicological information

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation. May cause an allergic skin reaction.
- Ingestion** : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects



Section 11. Toxicological information

| Product/ingredient name | Test | Endpoint | Species | Result |
|----------------------------|--|--------------------------|--------------------|------------|
| 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 |
| Epoxy phenol novolac resin | 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 |
| | 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 |
| | - | Sub-chronic NOEL Oral | Rat - Male, Female | 1000 mg/kg |
| tricresyl phosphate | | | | |
| Nonylphenol | OECD 407 Repeated Dose 28-day Oral Toxicity Study in Rodents | Sub-acute NOAEL Oral | Rat - Male, Female | 100 mg/kg |
| | EPA OPPTS | Sub-chronic NOAEL Oral | Rat - Male, Female | 50 mg/kg |

- General** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : Suspected of damaging the unborn child.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : Suspected of damaging fertility.

Numerical measures of toxicity

Acute toxicity estimates

| Route | ATE value |
|---------------------|---------------|
| Dermal | 32552.5 mg/kg |
| Inhalation (vapors) | 86.31 mg/l |

Other information : Not available.



Section 12. Ecological information

Toxicity

| Product/ingredient name | Test | Endpoint | Exposure | Species | Result |
|----------------------------|---|--------------|---------------------|----------|-----------|
| Bisphenol A epoxy resin | OECD 203 Fish, Acute Toxicity Test | Acute LC50 | 96 hours Static | Fish | 1.5 mg/l |
| Epoxy phenol novolac resin | - | 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 |
| | - | 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 |
| tricresyl phosphate | - | Acute LC50 | 96 hours Static | Fish | 0.6 mg/l |
| Nonylphenol | ASTM | Acute LC50 | 96 hours Static | Fish | 0.05 mg/l |

Persistence and degradability

| Product/ingredient name | Test | Period | Result |
|----------------------------|---|---------|--------|
| Bisphenol A epoxy resin | OECD Derived from OECD 301F (Biodegradation Test) | 28 days | 5 % |
| Epoxy phenol novolac resin | OECD Derived from OECD 301F (Biodegradation Test) | 28 days | 5 % |
| tricresyl phosphate | OECD 301D Ready Biodegradability - Closed Bottle Test | 28 days | 24.2 % |
| Nonylphenol | EPA OPPTS | 63 days | 100 % |
| | OECD | 56 days | 50 % |
| | OECD 301B Ready Biodegradability - CO ₂ Evolution Test | 35 days | 48.2 % |

Conclusion/Summary

: Bisphenol A epoxy resin Not readily biodegradable.
tricresyl phosphate 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 Fresh water 7.1 days | - | Not readily |
| Epoxy phenol novolac resin | Fresh water 4.83 days Fresh water 3.58 days Fresh water 7.1 days | - | Not readily |
| tricresyl phosphate | - | - | Not readily |

Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|----------------------------|--------------------|-----|-----------|
| Bisphenol A epoxy resin | 3.242 | 31 | low |
| Epoxy phenol novolac resin | 3.242 | 31 | low |
| tricresyl phosphate | 5.93 | - | high |
| Nonylphenol | 5.4 | 740 | high |

Mobility in soil

Section 12. Ecological information

Not available.

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

Other ecological information

BOD5 : Not determined.

COD : Not determined.

TOC : Not determined.

Section 13. Disposal considerations

Disposal methods : 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.

Section 14. Transport information

Proper shipping name

DOT : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXYPHENOL NOVOLAC RESIN). Marine pollutant

TDG : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXYPHENOL NOVOLAC RESIN). Marine pollutant







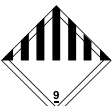

IMDG : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXYPHENOL NOVOLAC RESIN). Marine pollutant

IATA : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN, EPOXYPHENOL NOVOLAC RESIN)

| Regulatory information | UN number | Classes | PG* | Label | Additional information |
|------------------------|-----------|---------|-----|-------|------------------------|
| | | | | | |



Section 14. Transport 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 Classification | UN3082 | 9 | III |   | Emergency schedules (EmS) F-A, S-F |
| IATA Classification | UN3082 | 9 | III |   | Passenger and Cargo Aircraft Quantity limitation: 450 L Packaging instructions: 964 Cargo Aircraft Only Quantity limitation: 450 L Packaging instructions: 964 |

PG* : Packing group

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory : All components are listed or exempted.

TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.



Section 15. Regulatory information

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

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

SARA 313 : No ingredients listed.

CERCLA Hazardous substances : No ingredients listed.

State regulations

PENNSYLVANIA - RTK : No ingredients listed.

California Prop 65 : **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> |
|------------------------|---------------|---------------------|
| Methanol | No. | Yes. |

Canadian regulations

CEPA DSL : All components are listed or exempted.

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

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.

Brazil Regulations

Classification system used : Norma ABNT-NBR 14725-2:2012

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: At least one component is not listed.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): Not determined.



Section 16. Other information

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

| | |
|---------------------|---|
| Health | 2 |
| Flammability | 1 |
| Physical hazards | 1 |
| Personal protection | |

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

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

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



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Date of printing : 1/30/2014.
Date of issue : 1/30/2014.
Date of previous issue : No previous validation.
Version : 1

▀ Indicates information that has changed from previously issued version.

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Notice to reader

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

Section 16. Other information

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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SAFETY DATA SHEET

HARDENER 9816 US

Section 1. Identification

GHS product identifier : **HARDENER 9816 US**
Product code : 00056825
Other means of identification : Not available.
Product type : Liquid.
Material uses : Hardener for adhesive systems
Supplier's details : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

e-mail address of person responsible for this SDS : MSDS@huntsman.com

Emergency telephone number (24h/7day) : Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : ACUTE TOXICITY: ORAL - Category 4
ACUTE TOXICITY: SKIN - Category 4
SKIN CORROSION/IRRITATION - Category 1C
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SKIN SENSITIZATION - Category 1

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 95%
Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 95%

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: Harmful if swallowed or in contact with skin.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.

Section 2. Hazards identification

Precautionary statements : Wear protective gloves: > 8 hours (breakthrough time): Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber. Wear eye or face protection. Wear protective clothing. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. If skin irritation or rash occurs: Get medical attention. 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 or physician. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

| Ingredient name | % | CAS number |
|---|----------|------------|
| N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine | 60 - 100 | 68758-73-6 |
| Triethylene tetramine | 3 - 7 | 112-24-3 |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact :
Inhalation :
Skin contact :
Ingestion :

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.
Inhalation :
Skin contact :
Ingestion :

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
 pain
 watering
 redness
Inhalation : No specific data.



Section 4. First aid measures

- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Ingestion** : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.
- Protection of first-aiders** :

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- Flash point** : Closed cup: >100°C (>212°F) [Estimated]

Extinguishing media

- Suitable extinguishing media** :
- Unsuitable extinguishing media** :

- Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

- Special protective actions for fire-fighters** :
- Special protective equipment for fire-fighters** :

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : 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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- 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).



Section 6. Accidental release measures

Methods and materials for containment and cleaning up :

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). 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 breathe vapor or mist. Do not ingest. 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.

Advice on general occupational hygiene : 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : 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. Store locked up. 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.

Section 8. Exposure controls/personal protection

Control parameters

Appropriate engineering controls :

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.

Individual protection measures

Hygiene measures :

Eye/face protection : 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection :

Body protection :



Section 8. Exposure controls/personal protection

- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. 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.
- Thermal hazards** : Not available.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Liquid.
- Color** : Amber.
- Odor** : Amine-like.
- Odor threshold** : Not available.
- pH** : Not available.
- Melting point/Freezing point** : Not available.
- Boiling/condensation point** : Not available.
- Flash point** : Closed cup: >100°C (>212°F) [Estimated]
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Relative density** : 1.02
- Solubility in water** : practically insoluble
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : >200°C (>392°F)
- Density** : 1.02 g/cm³ [25°C (77°F)]
- Viscosity** : Dynamic (room temperature): 250 mPa·s (250 cP)

Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** :
- Conditions to avoid** :
- Incompatible materials** :



Section 10. Stability and reactivity

Hazardous decomposition :
products

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

| Product/ingredient name | Test | Endpoint | Species | Result |
|-------------------------|--------------------------------|-------------|-----------------------|--------------|
| Triethylene tetramine | OECD 402 Acute Dermal Toxicity | LD50 Dermal | Rabbit - Male, Female | 1465.4 mg/kg |
| | OECD 401 Acute Oral Toxicity | LD50 Oral | Rat - Male, Female | 1716.2 mg/kg |

Irritation/Corrosion

| Product/ingredient name | Test | Species | Result |
|-------------------------|--|---------|------------------|
| Triethylene tetramine | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Skin - Corrosive |
| | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Eyes - Corrosive |

Conclusion/Summary

| | | |
|--------------------|--|--|
| Skin | : N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine Triethylene tetramine | No additional information. Corrosive to the skin. |
| Eyes | : N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine Triethylene tetramine | No additional information. Corrosive to eyes. |
| Respiratory | : N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine Triethylene tetramine | No additional information. No additional information. |

Sensitization

| Product/ingredient name | Test | Route of exposure | Species | Result |
|-------------------------|-----------------------------|-------------------|------------|-------------|
| Triethylene tetramine | OECD 406 Skin Sensitization | skin | Guinea pig | Sensitizing |

Mutagenicity

| Product/ingredient name | Test | Result |
|-------------------------|---|----------|
| Triethylene tetramine | Experiment: In vitro Subject: Mammalian-Animal | Negative |
| | Experiment: In vivo Subject: Mammalian-Animal | Negative |

Conclusion/Summary :

Triethylene tetramine The weight of the scientific evidence indicates that this material is non-genotoxic.

Carcinogenicity



Section 11. Toxicological information

| Product/ingredient name | Test | Species | Dose | Exposure | Result/Result type |
|-------------------------|--|--------------|----------|--------------------|------------------------------|
| Triethylene tetramine | OECD 451 Carcinogenicity Studies | Mouse - Male | 42 mg/kg | 3 days per week | Negative - Dermal - NOAEL |

Reproductive toxicity

Conclusion/Summary :

Triethylene tetramine

In accordance with column 2 of Annex VII - X of Regulation (EC) No 1907/2006, the test for this property of the substance does not need to be conducted.

Teratogenicity

| Product/ingredient name | Test | Species | Result/Result type |
|-------------------------|--|---------|--------------------|
| Triethylene tetramine | OECD 414 Prenatal Developmental Toxicity Study | Rat | Negative - Oral |
| | OECD 414 Prenatal Developmental Toxicity Study | Rabbit | Negative - Dermal |

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.
Inhalation :
Skin contact :
Ingestion :

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
 pain
 watering
 redness
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
Ingestion : Adverse symptoms may include the following:
 stomach pains



Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

| Product/ingredient name | Test | Endpoint | Species | Result |
|-------------------------|--|------------------------|--------------------|------------|
| Triethylene tetramine | OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents | Sub-chronic NOAEL Oral | Rat - Male, Female | 50 mg/kg/d |

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity :

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects :

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

| Route | ATE value |
|--------|--------------|
| Oral | 1716.2 mg/kg |
| Dermal | 1465.4 mg/kg |

Other information : Not available.

Section 12. Ecological information

Toxicity

| Product/ingredient name | Test | Endpoint | Exposure | Species | Result |
|-------------------------|---------------------------------------|---------------------------|----------------------|----------|-----------|
| Triethylene tetramine | No official guidelines | Acute EC50 | 30 minutes Static | Bacteria | 800 mg/l |
| | EU EC C.2 Acute Toxicity for Daphnia | Acute EC50 | 48 hours Static | Daphnia | 31.1 mg/l |
| | OECD 201 Alga, Growth Inhibition Test | Acute ErC50 (growth rate) | 72 hours Semi-static | Algae | 20 mg/l |
| | EPA OPPTS EPA OTS 797.1400 | Acute LC50 | 96 hours Static | Fish | 330 mg/l |
| | No official guidelines | Chronic EC10 | 30 minutes | Bacteria | 42.5 mg/l |

Section 12. Ecological information

| | | | | | | |
|--|--|---------------|----------------------------------|---------|------|------|
| | OECD OECD 202: Part II (Daphnia sp., Reproduction Test | Chronic EC10 | Static 21 days Semi-static | Daphnia | 1.9 | mg/l |
| | OECD 201 Alga, Growth Inhibition Test | Chronic NOECr | 72 hours Semi-static | Algae | <2.5 | mg/l |

Persistence and degradability

| Product/ingredient name | Test | Period | Result |
|-------------------------|--|----------|--------|
| Triethylene tetramine | OECD 302A Inherent Biodegradability: Modified SCAS Test | 84 days | 20 % |
| | OECD 301D Ready Biodegradability - Closed Bottle Test | 162 days | 0 % |

Conclusion/Summary : Triethylene tetramine Not biodegradable

Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|-------------------------|--------------------|-----|-----------|
| Triethylene tetramine | -2.65 | 99 | low |

Mobility in soil

Not available.

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

Other ecological information

BOD5 : Not determined.

COD : Not determined.

TOC : Not determined.

Section 13. Disposal considerations

Disposal methods : 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.



Section 14. Transport information

Proper shipping name

DOT : Polyamines, liquid, corrosive, n.o.s. (N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine)
TDG : Polyamines, liquid, corrosive, n.o.s. (N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine)
IMDG : Polyamines, liquid, corrosive, n.o.s. (N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine)
IATA : Polyamines, liquid, corrosive, n.o.s. (N-[2-(imidazolidin-1-yl)ethyl]ethylenediamine)

| Regulatory information | UN number | Classes | PG* | Label | Additional information |
|----------------------------|-----------|---------|-----|--|--|
| DOT Classification | UN2735 | 8 | III |  | - |
| TDG Classification | UN2735 | 8 | III |  | - |
| IMDG Classification | UN2735 | 8 | III |  | Emergency schedules (EmS) F-A S-B |
| IATA Classification | UN2735 | 8 | III |  | Passenger and Cargo Aircraft Quantity limitation: 5 L Packaging instructions: 852 Cargo Aircraft Only Quantity limitation: 60 L Packaging instructions: 856 |

PG* : Packing group

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

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TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

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



Section 15. Regulatory information

- TSCA 12(b) export notification** : No ingredients listed.
- SARA 311/312** : Immediate (acute) health hazard
- Clean Air Act - Ozone Depleting Substances (ODS)** : This product does not contain nor is it manufactured with ozone depleting substances.
- SARA 313** : No ingredients listed.
- CERCLA Hazardous substances** : No ingredients listed.

State regulations

- PENNSYLVANIA - RTK** : Triethylene tetramine
- California Prop 65** : This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canadian regulations

- CEPA DSL** : At least one component is not listed.
- WHMIS Classes** : Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material

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.

Brazil Regulations

- Classification system used** : Norma ABNT-NBR 14725-2:2012

International lists

- Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): At least one component is not listed.
Japan inventory: Not determined.
Korea inventory: At least one component is not listed.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): At least one component is not listed.
Taiwan inventory (CSNN): Not determined.

Section 16. Other information

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

| | |
|---------------------|---|
| Health | 3 |
| Flammability | 1 |
| Physical hazards | 1 |
| Personal protection | |



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National Fire Protection
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Further information :

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Section 16. Other information

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