

1. Product Identification

Product name	General Purpose Epoxy Resin	
SDS Number	0100A00	
Product type	Epoxy polymer mixture.	
Recommended use of the chemical and restrictions on use	Directed at, but not limited to, the coating, bonding, and reinforcing of wood and fiber composites.	
Restrictions	None known.	
Manufacturer/Supplier information		
Company name	SYSTEM THREE RESINS, INC.	
Address	3500 W. Valley Hwy, Suite Suite 105 Auburn, WA 98001-2436 United States	
Telephone	1-253-333-8118	
Website	www.systemthree.com	
Email	support-08@systemthree.com	
Emergency Contact	CHEMTREC (U.S. and CANADA)	1-800-424-9300
	CHEMTREC (Outside the U.S.)	1-703-527-0585

2. Hazard(s) Identification

Classification of substance or mixture/Signal Word	DANGER. Skin Corrosion/Irritation - Category 2 Serious Eye Damage/Eye Irritation - Category 2 Skin Sensitizer – Category 1 Specific Target Organ Toxicity (Single Exposure) [Respiratory tract irritation] – Category 3	
--	---	--

GHS Label Elements
Hazard Pictograms



Hazard Statements/Classification of substance or mixture	H315	Causes skin irritation.
	H317	May cause an allergic skin reaction.
	H319	Causes serious eye irritation.
	H335	May cause respiratory irritation.

Precautionary statements

Precautionary Statements
Prevention

P201	Obtain special instructions before use.
P261	Avoid breathing vapors.
P264	Wash hands 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.

Response	P280 Wear protective gloves. Wear eye or face protection. P304 + 340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P302+352 IF ON SKIN: Wash with soap and water. P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P308 + P313 If exposed or concerned: Get medical attention. P312 Call a POISON CENTER or doctor/physician if you feel unwell.
Storage	P362 + P364 Take off contaminated clothing and wash it before reuse. P401 Store above 32 °F / 0 °C P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
Disposal	P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified (HNOC)	None Available.

3. Composition/Information On Ingredients

Chemical Name	CAS Number	Content (%)
Diglycidyl Ether of Bisphenol A	25068-38-6	60 – 70 %
Alkyl Glycidyl Ether	68609-97-2	15 – 20%
Alkyl Glycidyl Ether	74398-71-3	1 – 10%
Diglycidyl Ether of Bisphenol F	28064-14-4	1 – 10%

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section. Occupational exposure limits, if available, are listed in Section 8.

4. First-Aid Measures

Skin contact	Remove contaminated clothing and shoes and wipe excess off skin. Flush skin with water. Follow by washing in soap and water. If irritation occurs, seek medical attention. Do not reuse clothing until cleaned. Contaminated leather articles (shoes) cannot be decontaminated and should be destroyed.
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. Seek medical attention.
Ingestion	Wash out mouth with water. 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. Following exposure or if feeling unwell. Never give anything by mouth to an unconscious person. If unconscious, place in a recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Inhalation	Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.

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

Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	No specific treatment.

5. Fire-Fighting Measures

Suitable extinguishing media	Alcohol-resistant foam, dry chemical, water fog or carbon dioxide (CO ₂).
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 must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous decomposition products	Decomposition products may include the following materials: Carbon dioxide Carbon monoxide
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.
Further information	Do not allow run-off from firefighting to enter drains or water courses. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Wear proper protective clothing, gloves and eye/face protection.
Emergency procedures	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials.
Methods and materials for containment/cleanup	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. 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. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.
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).

7. Handling and Storage

Precautions for safe handling	Put on appropriate personal protective equipment. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid contact with skin and eyes. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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. When using, do not eat, drink or smoke. 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.

Precautions/Recommendations for safe/proper 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 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.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

None established.

Appropriate engineering controls

Use only with adequate ventilation. 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

Use appropriate containment to avoid environmental contamination. Do not allow spill to enter sewers or waterways.

Individual protection measures/Personal protective equipment

Eye/face protection

Splash-proof goggles or safety spectacles with side shields are recommended. Always wear eye protection when sanding cured epoxy resins to avoid dust in eyes.

Hand protection

Always wear impervious gloves: butyl rubber, nitrile rubber, Neoprene, PVC disposable gloves,

Skin protection

Wear clean, body-covering clothing to avoid skin contact.

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.

Special instructions for protection and hygiene

Discard contaminated leather articles. Remove contaminated clothing. Wash at the end of each work shift and before eating smoking or using the toilet. Provide readily accessible eye wash stations and safety showers.

9. Physical and Chemical Properties

Chemical family

Epoxy Resin

Appearance

Pourable liquid

Physical State

Epoxy polymer mixture

Form

Liquid

Color

Water clear

Odor

Little or no odor

Density (Specific Gravity)

9.5-9.7 lb/gal (1.1-1.2)

Viscosity

600-750 cps @ 25°C

pH

N/A

Melting point/freezing point

Data not available

Initial boiling point and boiling range	Data not available
Flash point	>300°F, Pensky-Martens Closed Cup
Evaporation rate	Slower than ether
Flammability (solid, gas)	Data not available
Upper/lower flammability limit (by volume)	
Upper flammability limit (by volume)	N/A
Lower flammability limit (by volume)	N/A
Material VOC	None
Vapor density	Heavier than air
Relative density	Not determined
Solubility in water	Negligible, in water
Partition coefficient: n-octanol/water	Data not available
Auto-ignition temperature	300°C (572.00°F)
Decomposition temperature	Not available

10.Stability and Reactivity

Reactivity	Stable.
Chemical Stability	Stable under normal conditions.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	Epoxy resins and epoxy resin hardeners react with each other producing heat. They should not be mixed with each other under uncontrolled conditions or in large mass as the ensuing exotherm may result in heat and smoke, resulting in hazardous decomposition products.
Incompatible materials	Reactive or incompatible with the following materials: Strong oxidizing agents Lewis acids Mineral acids
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Other hazards	None known.

11. Toxicological Information

Acute Health Hazard (components) No comprehensive data (ingestion, inhalation, dermal) on mixture (product).

Component	Result	Species	Dose	Exposure
Diglycidyl Ether of Bisphenol A	LD50 Oral	Rat	11,400 mg/kg	-
	LD50 Dermal	Rat	2,000 mg/kg	-
Diglycidyl Ether of Bisphenol F	LD50 Oral	Rat	>2,000 mg/kg	-
	LD50 Dermal	Rat	>2,000 mg/kg	-
Alkyl Glycidyl Ether	LD50 Oral	Rat	17,100 mg/kg	-

Alkyl Glycidyl Ether	LD50 Oral	Rat	>5,000 mg/kg	-
	LD50 Dermal	Rabbit	>2,000 mg/kg	-

Irritation/Corrosion (components) No information on product itself.

Component	Result	Species	Test	Exposure
Diglycidyl Ether of Bisphenol A	Moderate to severe irritation	Rabbit	Skin	4 h
	Mild irritation	Rabbit	Eye	24 h
Diglycidyl Ether of Bisphenol F	Mild irritant	Rabbit	Skin	-
	Mild irritant	Rabbit	Eye	-
Alkyl Glycidyl Ether	Moderate irritant	Rabbit	Skin	24 h

Sensitization No information on product itself.

Mutagenicity No information on product itself.

Carcinogenicity No information on product itself.

Reproductive Toxicity No information on product itself.

Teratogenicity No information on product itself.

Specific target organ toxicity (single exposure) No information on product itself.

Component	Category	Route of exposure	Target organs
Diglycidyl Ether of Bisphenol A	Category 3		Respiratory tract irritation
Diglycidyl Ether of Bisphenol F	Category 3		Respiratory tract irritation
Alkyl Glycidyl Ether	Category 3		Respiratory tract irritation

Specific target organ toxicity (repeated exposure) No information on product itself.

Aspiration hazard No information on product itself.

Potential acute health effects

Eye Contact	Causes serious eye irritation.
Inhalation	May cause respiratory irritation.
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 Watering Redness
Inhalation	Adverse symptoms may include the following: Respiratory tract irritation Coughing
Skin Contact	Adverse symptoms may include the following: Irritation Redness
Ingestion	No specific data.

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

Potential chronic health effects

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	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.

Numerical measures of toxicity

<u>Acute toxicity estimates (ATEmix)</u>	Not available.
--	----------------

12. Ecological Information

Ecotoxicity

No information on product itself.

Component	Test	Species	Result	Exposure
Diglycidyl Ether of Bisphenol A	Acute LC50	Fish	1.3 mg/l	96 h
	Acute LC50	Daphnia	2.1 mg/l	48 h
Diglycidyl Ether of Bisphenol F	Acute LC50	Fish	1.5 mg/l	96 h
	Acute LC50	Daphnia	1.7 mg/l	48 h
	Chronic NOEC	Daphnia	0.3 mg/l	21 d
Alkyl Glycidyl Ether	Acute LC50	Fish	1.8 g/l	96 h
	Acute EC50	Daphnia	7.2 mg/l	48 h
	Acute EC50	Algae	844 mg/l	72 h

Persistence and degradability

No information on product itself.

Bioaccumulative Potential

No information on product itself.

Component	LogPow	BCF	Potential
Diglycidyl Ether of Bisphenol A	2.64 – 3.78	3 – 31 31.00	Low
Diglycidyl Ether of Bisphenol F	3	-	low
Alkyl Glycidyl Ether	3.77	160 – 263 160.00	low

Mobility in Soil

Soil/water partition coefficient (KOC)	No information on product itself.
Other adverse effects	No known significant effects or critical hazards.

13. Disposal Considerations

Waste from residues/ unused products	Product should not be allowed to enter drains, water courses or the soil; dispose of this material and its containers in a safe way. Contact supplier if guidance is required.
--------------------------------------	--

Contaminated packaging

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International Transport Regulations

Regulatory information	UN/NA number	Proper Shipping Name	Classes/*PG	Additional Information
DOT		Not regulated		
TDG		Not regulated		
IMO/IMDG	UN3082	Environmentally Hazardous Substance, Liquid, n.o.s. (Bisphenol-A Epichlorohydrin Resin)	Class 9 III	
IATA (Cargo)	UN3082	Environmentally Hazardous Substance, Liquid, n.o.s. (Bisphenol-A Epichlorohydrin Resin)	Class 9 III	
*PG: Packing group				
Special precautions for user:		Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.		

15. Regulatory Information

UNITED STATES

U.S. Federal Regulations

United States – TSCA 12(b) – Chemical export notification: None Required.
United States – TSCA 5(a)2 – Final significant new use rules: Not Listed.
United States – TSCA 5(a)2 – Proposed significant new use rules: Not Listed.
United States – TSCA 5(e) – Substance consent order: Not listed.

California Prop. 65

WARNING: This product contains less than 0.1% of 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.

Ingredient Name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Oxirane, 2-(phenoxyethyl)-	Yes	No	5 µg/day	No
Oxirane, 2-(chloromethyl)-	Yes	Yes	9 µg/day	No

EPA SARA 302 Extremely Hazardous Substances

None required.

EPA SARA 302/304/311/312 Hazardous Chemicals

Acute Health Hazard.

United States inventory (TSCA 8b)

All components are listed or exempted.

CANADA

WHMIS (Canada)

Class D-2B: Material causing other toxic effects (Toxic).

Canadian NPRI
CEPA Toxic substances

None required.
None required.

INTERNATIONAL REGULATIONS

International Lists

Australia inventory (AICS): All components are listed or exempted.

Canada inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Japan inventory: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
New Zealand inventory (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): All components are listed or exempted.

16. Other Information, Including Date of Preparation or Last Revision

HMIS Rating

Health	2
Flammability	1
Physical Hazard	0

Date of Preparation	February 15, 2017
Date of Last Revision	September 15, 2015
Revision #	2.0
More Information	1-253-333-8118
Prepared by	N. Kim, System Three Resins Inc.

The information contained herein is based on the data available to us and is believed to be correct. However, System Three Resins, Inc. makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. System Three assumes no responsibility for injury from the use of the product described herein.



SAFETY DATA SHEET

1. Product Identification

Product name	General Purpose Hardener #2	
SDS Number	0102B00	
Product type	Polyamine mixture	
Recommended use of the chemical and restrictions on use	Directed at, but not limited to, the molding and coating of fiber-reinforced composites and wood.	
Restrictions	None known.	
Manufacturer/Supplier information		
Company name	SYSTEM THREE RESINS, INC.	
Address	3500 W. Valley Hwy, Suite Suite 105 Auburn, WA 98001-2436 United States	
Telephone	1-253-333-8118	
Website	www.systemthree.com	
Email	support@systemthree.com	
Emergency Contact	CHEMTREC (U.S. and CANADA)	1-800-424-9300
	CHEMTREC (Outside the U.S.)	1-703-527-0585

2. Hazard(s) Identification

Classification of substance or mixture/Signal Word	DANGER Acute Toxicity (oral, dermal) – Category 4 Skin Corrosion/Irritation – Category 2 Serious Eye Damage/Eye Irritation – Category 1 Respiratory Sensitization – Category 1 Skin Sensitization – Category 1 Toxic to Reproduction [Fertility, Unborn child]– Category 2 Specific Target Organ Toxicity (Single Exposure) [skin, eyes, mucous membrane, lungs] – Category 1 Specific Target Organ Toxicity (Single Exposure) [central nervous system (CNS), nervous system] – Category 2 Specific Target Organ Toxicity (Repeated Exposure) [respiratory tract, kidney, skin, lungs, liver] – Category 1 Aquatic Hazard (Acute) – Category 1 Aquatic Hazard (Long-term) – Category 1
--	---

GHS Label Elements
Hazard Pictograms



Hazard Statements/Classification of substance or mixture

H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H334 May cause allergy or asthmatic symptoms or breathing difficulties if inhaled.
H361 Suspected of damaging fertility or the unborn child.
H370 Causes damage to organs.
H371 Causes damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements**Precautionary Statements
Prevention**

P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P262 Do not get in eyes, on skin, or on clothing.
P264 Wash hands 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.

Response

P273 Avoid release to the environment.
P280 Wear protective gloves. Wear eye or face protection.
P313 Call a POISON CENTER or doctor/physician if you feel unwell.
P302+352+363 IF ON SKIN: Wash with soap and water. Take off contaminated clothing and wash before reuse.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Storage

P401 Store at room temperature in a well-ventilated area.

Disposal

P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified (HNOC)

None Available.

3. Composition/Information On Ingredients

Chemical Name	CAS Number	Content (%)
Nonyl Phenol	25154-52-3	50-60%
Aliphatic/Cycloaliphatic Amine Mixture	Trade Secret	20-30%
n-Aminoethylpiperazine	140-31-8	1-10%
Triethanolamine	102-71-6	1-5%
Piperazine	110-85-0	<2%

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section. Occupational exposure limits, if available, are listed in Section 8.

4. First-Aid Measures**Skin contact**

Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Flush immediately with copious amounts of water. Initiate and maintain continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour. Cover wound with sterile dressing.

Eye contact

Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and

Ingestion

lower eyelids. Check for and remove contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Get medical attention immediately. Call a poison center or physician. 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 without medical advice. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain open airway. Loosed tight clothing such as a collar, tie, belt, or waistband.

Inhalation

Move to fresh air.

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.

Specific treatments

No specific treatment.

5. Fire-Fighting Measures

Suitable extinguishing media

Alcohol-resistant foam, carbon dioxide (CO₂), dry chemical, water fog.

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 must be contained and prevented from being discharged to any waterway, sewer or drain. May generate ammonia gas. May generate toxic nitrogen oxide gases. Use of water may result in the formation of very toxic aqueous solutions.

Hazardous decomposition products

Decomposition products may include the following materials:

Carbon dioxide, carbon monoxide, nitrogen oxides

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.

Further information

Do not allow run-off from firefighting to enter drains or water courses. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Wear proper protective clothing, gloves and eye/face protection.

Emergency procedures

If material is spilled, avoid contact with material. Persons not wearing appropriate protective equipment should leave the area of the spill until cleanup is complete.

Methods and materials for containment/cleanup	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. 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. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.
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).

7. Handling and Storage

Precautions for safe handling	Put on appropriate personal protective equipment. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid contact with skin and eyes. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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. When using, do not eat, drink or smoke. 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.
Precautions/Recommendations for safe/proper 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 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.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits	None established.
Appropriate engineering controls	Use only with adequate ventilation. 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. Do not allow spill to enter sewers or waterways.
Individual protection measures/Personal protective equipment	
Eye/face protection	Splash-proof goggles or safety spectacles with side shields are recommended. Always wear eye protection when sanding cured epoxy resins to avoid dust in eyes.
Hand protection	Always wear impervious gloves: butyl rubber, nitrile rubber, Neoprene, PVC disposable gloves,
Skin protection	Wear clean, body-covering clothing to avoid skin contact.

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.
Special instructions for protection and hygiene	Wear gloves at all times when handling product, avoid direct contact with skin. When finished using product, dispose of gloves properly and wash hands with warm, soapy water.

9. Physical and Chemical Properties

Chemical family	Amine Curing Agent
Appearance	Clear liquid
Physical State	
Form	Pourable liquid
Color	Medium Amber
Odor	Ammoniacal
Density (Specific Gravity)	0.95 – 0.97
Viscosity	1500 – 2000 CPS @ 77 °F (25 °C)
pH	Alkaline
Melting point/freezing point	N/A
Initial boiling point and boiling range	N/A
Flash point	>250 °F Pensky-Martin's Closed Cup
Evaporation rate	Slower than ether
Flammability (solid, gas)	N/A
Upper/lower flammability limit (by volume)	
Upper flammability limit (by volume)	N/A
Lower flammability limit (by volume)	N/A
Material VOC	N/A
Vapor density	Heavier than air
Relative density	N/A
Solubility in water	Negligible in water
Partition coefficient: n-octanol/water	N/A
Auto-ignition temperature	N/A
Decomposition temperature	N/A

10. Stability and Reactivity

Reactivity	Stable under normal conditions.
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	Epoxy resins and epoxy resin hardeners react with each other producing heat. They should not be mixed with each other under uncontrolled conditions or in a large mass as the ensuing exotherm may result in heat and smoke.
Incompatible materials	Strong oxidizing agents and mineral acids.
Hazardous decomposition products	Oxides of carbon, nitrogen
Other hazards	None known.

11. Toxicological Information

Acute Health Hazard (components) No comprehensive data (ingestion, inhalation, dermal) on mixture (product).

Component	Result	Species	Dose	Exposure
Aliphatic/Cycloaliphatic Amine Mixture	LD50 Oral	Rat	1,080 mg/kg	-
	LD50 Dermal	Rabbit	675 mg/kg	-
	LD50 Dermal	Rabbit	1,090 mg/kg	-
	LD50 Oral	Rat	3,250 mg/kg	-
	LD Dermal	Rabbit	1,090 mg/kg	-
Nonyl Phenol	LD50 Dermal	Rabbit	2,000 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
n-Aminoethylpiperazine	LD Oral	Rat	>1,000 mg/kg	-
	LD50 Dermal	Rabbit	866 mg/kg	-
Triethanolamine	LD50 Oral	Rat	6,400 mg/kg	-
	LD50 Dermal	Rabbit	>2,000 mg/kg	-
Piperazine	LD50 Dermal	Rabbit	8,300 mg/kg	-
	LD Oral	Rat	2,600 mg/kg	-

Irritation/Corrosion (components) Classifies as non-corrosive to skin per negative Corrositex Dermal Testing.
Classifies as Serious eye damage Category 1 per GHS calculations of additivity.

Component	Result	Species	Test	Exposure
Aliphatic/Cycloaliphatic Amine Mixture	Skin-Moderate irritant	Rabbit	-	-
	Skin-Erythema/E schar	Rabbit	404 Acute Dermal Irritation/Corrosion	4 hrs
	Eyes-Cornea opacity	Rabbit	405 Acute Eye Irritation/Corrosion	-
n-Aminoethylpiperazine	Eyes-Moderate irritant	Rabbit		24 hrs
	Skin-Severe irritant	Rabbit		24 hrs
Piperazine	Skin-Corrosive	Rabbit	OECD 404 Dermal Irritation/Corrosion	-
	Eyes-Corrosive	Mammal-species unspecified	No official guidelines	-

Sensitization No information on product itself.

Component	Test	Route of exposure	Species	Result
n-Aminoethylpiperazine	OECD 406 Skin Sensitization	Skin	Guinea pig	Sensitizing

Piperazine	No official guidelines	Respiratory	Human	Sensitizing
	No official guidelines	Skin	Human	Sensitizing
	No official guidelines	Skin	Guinea pig	Sensitizing

Mutagenicity No information on product itself.

Carcinogenicity No information on product itself.

Reproductive Toxicity No information on product itself.

Component	Test	Species	Maternal toxicity	Fertility	Developmental effects
Triethanolamine	OECD 421 Reproduction/Developmental Toxicity Screening Test	Rat	Negative	Positive	Negative
Piperazine	OECD 416 Two-Generation Reproduction Toxicity Study	Rat	Positive	Positive	-

Teratogenicity No information on product itself.

Specific target organ toxicity (single exposure) No information on product itself.

Component	Category	Route of exposure	Target organs
Aliphatic/Cycloaliphatic Amine Mixture	Category 2		Eyes, nervous system
	Category 3		Respiratory tract irritation
	Category 2		Central nervous system (CNS)
n-Aminoethylpiperazine	Category 1		Skin, lungs

Specific target organ toxicity (repeated exposure) No information on product itself.

Component	Category	Route of exposure	Target organs
Aliphatic/Cycloaliphatic Amine Mixture	Category 1		Kidneys, skin, lungs
	Category 2		Bladder, kidneys, liver
Triethanolamine	Category 2		Kidneys, liver

Aspiration hazard No information on product itself.

Potential acute health effects

Eye Contact	Causes serious eye damage.
Inhalation	Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Contact	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Ingestion	Harmful if swallowed. May cause burns to mouth, throat, and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye Contact	Adverse symptoms may include the following: Pain Watery eyes Redness
Inhalation	Adverse symptoms may include the following: Wheezing and breathing difficulties Asthma Reduced fetal weight

Skin Contact

Increase in fetal deaths

Adverse symptoms may include the following:

Pain or irritation

Redness

Blistering may occur

Reduced fetal weight

Increase in fetal deaths

Ingestion

Adverse symptoms may include the following:

Stomach pains

Reduced fetal weight

Increase in fetal deaths

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

No information on product itself.

Potential chronic health effects

Component	Result	Species	Test	Endpoint
Nonyl Phenol	100 mg/kg	Rat	OECD 407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Sub-acute NOAEL Oral
	50 mg/kg	Rat	EPA OPPTS	Sub-chronic NOAEL Oral
Triethanolamine	>1,000 mg/kg/d	Rat	OECD 408 Repeated Dose 90-day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral
	125 to 500 mg/kg	Rat	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOAEL Dermal
	500 mg/m3	Rat	OECD 412 Repeated Dose Inhalation Toxicity: 28-day or 14-day Study	Sub-acute NOEC Inhalation Dusts and mists
n-Aminoethylpiperazine	151 to 285 mg/kg/d	Rat	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test	Sub-acute NOAEL Oral
	>1,000 mg/kg/d	Rat	OECD 410 Repeated Dose Dermal Toxicity: 21/28-day Study	Sub-acute NOAEL Dermal
Piperazine	627 mg/kg/d	Rat	No official guidelines	Sub-chronic NOEL Oral

General

Causes damage to organs through prolonged or repeated exposure: 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 (ATEmix)**

Route	ATE value
Oral	1341.5 mg/kg
Dermal	1420.7 mg/kg
Inhalation (vapors)	1035.2 mg/l

12. Ecological Information

Ecotoxicity

No comprehensive data available on product itself.

Component	Test	Endpoint	Exposure	Species	Result
Aliphatic/Cycloaliphatic Amine Mixture		Acute EC50	48 hrs	Aquatic invertebrates. Daphnia	16 mg/l
Nonyl Phenol	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute EC50	3 hrs Static	Bacteria	950 mg/l
	ASTM	Acute EC50	48 hrs Static	Daphnia	0.085 mg/l
	ASTM	Acute LC50	96 hrs Static	Fish	0.05 mg/l
Triethanolamine	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute EC50	180 minutes Static	Bacteria	>1,000 mg/l
Piperazine	OECD 211 Daphnia Magna Reproduction Test	Chronic NOEC	21 days Semi-static	Daphnia	12.5 mg/l
n-Aminoethylpiperazine	OECD 201 Alga, Growth Inhibition Test	Acute EC50	72 hrs	Algae	>1,000 mg/l

Persistence and degradability

No information on product itself.

Component	Test	Period	Result
Nonyl Phenol	EPA OPPTS	63 days	100%
	OECD	56 days	50%
	OECD 301B Ready Biodegradability – CO2 Evolution Test	35 days	48.2%
Triethanolamine	No official guidelines	5 days	100%
Piperazine	OECD 301F Ready Biodegradability – Manometric Respirometry Test	28 days	70.2%
n-Aminoethylpiperazine	OECD 301F Ready Biodegradability – Manometric Respirometry Test	28 days	0%

Bioaccumulative Potential

No information on product itself.

Component	LogPow	BCF	Potential
Aliphatic/Cycloaliphatic Amine Mixture	-1.3	0.65 2.80	low
	3.4	73	low
Nonyl Phenol	5.4	740	high
n-Aminoethylpiperazine	-1.48	-	low
Triethanolamine	-2.3	<3.9	Low
Piperazine	-1.24	3.9	Low

Mobility in Soil

Soil/water partition coefficient (KOC)

No information on product itself.

Other adverse effects

No known significant effects or critical hazards.

13. Disposal Considerations

Waste from residues/ unused products

Product should not be allowed to enter drains, water courses or the soil; dispose of this material and its containers in a safe way. Contact supplier if guidance is required.

Contaminated packaging

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International Transport Regulations

Regulatory information	UN/NA number	Proper Shipping Name	Classes/*PG	Additional Information
DOT		Non-regulated		
TDG		Non-regulated		
IMO/IMDG	UN3082	Environmentally hazardous substance, liquid, n.o.s. (Nonyl Phenol)	Class 9 III	Marine pollutant
IATA (Cargo)	UN3082	Environmentally hazardous substance, liquid, n.o.s. (Nonyl Phenol)	Class 9 III	Marine pollutant

*PG: Packing group

Special precautions for user:

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

15. Regulatory Information

UNITED STATES

U.S. Federal Regulations

United States – TSCA 12(b) – Chemical export notification: None Required.
 United States – TSCA 5(a)2 – Final significant new use rules: Not Listed
 United States – TSCA 5(a)2 – Proposed significant new use rules: Not Listed.
 United States – TSCA 5(e) – Substance consent order: Not listed.

Clean Air Act – Ozone Depleting Substances (ODS)

This product does not contain nor is manufactured with ozone depleting substances.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)

Product Name	Concentration %
Phenol	0 - 1

Pennsylvania – RTK

Phenol, Triethanolamine, Piperazine, N-Aminoethylpiperazine

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient Name	Cancer	Reproductive
Phenol, 4,4'-(1-methylethylidene)bis-	No.	Yes.

EPA SARA 302 Extremely Hazardous Substances

None known

EPA SARA 302/304/311/312 Hazardous Chemicals

Acute health hazard
 Chronic health hazard

SARA 313

Form R – Reporting requirements

Product Name	CAS
Phenol, 4-nonyl-, branched	84852-15-3
Phenol, 4,4'-(1-methylethylidene)bis-	80-05-7

CERCLA Hazardous substances

Component	%	Section 304 CERCLA	CERCLA Reportable	Product Reportable
-----------	---	--------------------	-------------------	--------------------

		Hazardous Substance	Quantity (lbs)	Quantity (lbs)
Phenol	1	Listed		

United States inventory (TSCA 8b)

All components are listed or exempted.

CANADA

WHMIS (Canada)

Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material.

Canadian NPRI
CEPA Toxic substances

None required.
None required.

INTERNATIONAL REGULATIONS

International Lists

Australia inventory (AICS): All components are listed or exempted.
Canada inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Japan inventory: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
New Zealand inventory (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): All components are listed or exempted.

16. Other Information, Including Date of Preparation or Last Revision

HMIS Rating

Health 3
Flammability 1
Physical Hazard 0

Date of Preparation	November 12, 2018
Date of Last Revision	April 12, 2017
Revision #	3.0
More Information	1-253-333-8118
Prepared by	N. Kim, System Three Resins Inc.

The information contained herein is based on the data available to us and is believed to be correct. However, System Three Resins, Inc. makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. System Three assumes no responsibility for injury from the use of the product described herein.