SAFETY DATA SHEET

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.

	P280 Wear protective gloves. Wear eye or face protection.
Response	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. P362 + P364 Take off contaminated clothing and wash it before reuse.
Storage	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 color, 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 (CO2).
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

Acute toxicity estimates (ATEmix)	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-(phenoxymethyl)-	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 None required.

CEPA Toxic substances 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 #1
SDS Number	0101B00
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 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@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 Organ Toxicity (Single Exposure) [eyes, skin, lungs, central nervous system (CNS), nervous system] – Category 1
Specific Target Organ Toxicity (Repeated Exposure) [kidney, skin, lungs] – 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.
P273 Avoid release to the environment.
P280 Wear protective gloves. Wear eye or face protection.

Response

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 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.

Ingestion

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 (CO_2), 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	Straw Yellow
Odor	Ammoniacal
Density (Specific Gravity)	0.9 – 1.0
Viscosity	110 – 120 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 biological corrosivity testing. The product caused irreversible alteration of tissue on none of the six animals after a four hour exposure period.

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	Rate	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 Causes skin irritation. Toxic in contact with skin. 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
Watering
Redness

Inhalation Adverse symptoms may include the following:
Wheezing and breathing difficulties
Asthma
Reduced fetal weight
Increase in fetal deaths

Skin Contact 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	1370.2 mg/kg
Dermal	1369.8 mg/kg
Inhalation (vapors)	1525.4 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 – CO_2 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 less than 0.1% of a chemical known to the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient Name	Cancer	Reproductive
Diethanolamine	Yes.	No.
Ehylene glycol	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	Concentration %
Phenol	0 - 1

CERCLA Hazardous substances

Component	%	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity (lbs)	Product Reportable 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).
Canadian NPRI	None required.
CEPA Toxic substances	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 15, 2018
Date of Last Revision	May 18, 2017
Revision #	4.0
More Information	1-253-333-8118
Prepared by	N. Kim, System Three Resins Inc.

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