POLYMER SCIENCE CORPORATION

SAFETY DATA SHEET

1. IDENTIFICATION

1.1 Product identifier

Trade name **: PSC 2301 ClearGuard Epoxy Hardener Part "B":**

Chemical name : Blend of Phenols and Amines

1.2 Recommended use of the product and restrictions on use

Recommended use : Industrial Use

Non- recommended use(s) : None known

1.3 Details of the supplier of the safety data sheet

Company : Polymer Science Corporation.
: Unit 1133, 6027 – 79 Avenue S.E
: Calgary, Alberta. Canada T2C 5P1

Telephone : 403 287 2751

Fax : 403 287 2766

Website : www.polymersciencecorp.com

1.4 Emergency telephone number

Emergency In case of emergency call 403 796 9826 or 403 510 2051

2. HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Acute Toxicity oral	Category 4
Acute Toxicity dermal	Category 3
Skin Corrosion / irritation	Category 1B
Eye Damage / Eye Irritation	Category 1
Acute Aquatic toxicity	Category3
Chronic Aquatic toxicity	Category 2

2.2 Label Elements

Symbol :

Signal word : Danger

Hazard statement : Harmful if swallowed
Toxic in contact with skin
Causes severe skin burns and eye damage
May cause an allergic skin reaction
Harmful if inhaled
May cause respiratory irritation
Harmful to aquatic life with long lasting effects

Precautionary Statements : Wear protective gloves / protective clothing / eye protection / face protection.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product
Wash with plenty of water and soap thoroughly after handling
IF ON SKIN: wash the area with plenty of water. If skin irritation persists 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.
Specific treatment for contact with skin is to use soap to remove the resin.
Take off contaminated clothing and wash it before reuse.
Avoid release to the environment
Do not breathe fume / vapors/ spray.
If swallowed: Call a poison center / doctor
If swallowed: Rinse mouth, do not induce vomiting.
If on skin: wash with plenty of water. Use a gentle soap.
If on skin: Take off immediately all contaminated clothing. Rinse skin with water / shower.
If on skin: Get medical attention if skin rash occurs.
If inhaled: Remove person to fresh air, keep at rest in a position comfortable for breathing.
If exposed or concerned: Get medical attention or advice. Call a poison center or doctor if feel unwell.
In case of spillage, wear suitable protective equipment, Use absorbent material, keep it in suitable, closed Containers and dispose accordingly.

3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances
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3.2 Mixtures

CLEARGUARD / HARDENER

HAZARDOUS INGREDIENTS	C.A.S.#	WEIGHT %
Nonylphenol. / 4 Nonyl-Phenol	84852-15-3	30 - 70
Polyoxyalkyleneamine./ Poly (propylene glycol) bis (2-aminopropyl ether)	9046-10-0	10 - 40
Isophoronediamine. / 3-aminomethyl-3,5,5-trimethylcyclohexylamine	2855-13-2	10 - 40
N-Aminoethylpiperazine. / 2-(piperazin-1-yl) ethanamine.	140-31-8	5 - 25

A percentage concentration range is provided, due to the fact that the actual concentration is withheld as a trade secret.

4 FIRST AID MEASURES

EYE CONTACT: Small amounts splashed into the eyes can cause irreversible tissue damage and blindness. Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. If eye irritation persists: Get medical attention. Continue rinsing eyes during transport to hospital. Protect unharmed eye. Keep eye wide open while rinsing.

SKIN CONTACT: If on skin or hair, take off immediately all contaminated clothing and shoes. Rinse skin, washing thoroughly with soap and water. Do not use solvents or thinners to clean skin. Get medical attention if irritation persists. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty

INHALATION: If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

INGESTION: Clean mouth with water and drink afterwards plenty of water. Keep respiratory tract clear. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician. Do not give milk or alcoholic beverages Immediately calla POISON CENTER / Doctor

5 FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media : Dry chemical, CO2, water spray or regular foam
Unsuitable extinguishing media : Full water jet, because this may spread the fire.
5.2 Hazards
Flammable properties and hazards : Product is not considered a fire hazard. Containers can build up pressure if exposed to heat.
Hazardous combustion products : Hazardous decomposition products formed under fire conditions are Carbon dioxide, Carbon monoxide and Nitrogen oxides. Phenol and other toxic vapors may be generated
Specific hazards during fire-fighting : Do not allow run-off from fire-fighting to enter drains or water courses.
5.3 Fire-fighting instructions:
Do not inhale combustion gases. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures.
Use personal protective equipment. Wear chemical safety glasses, rubber boots and heavy rubber gloves.
Ensure adequate ventilation. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform the respective authorities.
6.2 Environmental precautions
Do not allow to enter drains, waterways, sewers, basements or confined areas.
Do not discharge into the subsoil / soil. Absorb spills with inert material and place in a chemical waste container.3
6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, universal binder, sawdust) Keep in suitable, closed containers for disposal.

7 HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid all personal contact. Use personal protective equipment. Use adequate ventilation. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator.
7.2 Hygiene considerations.
Wash hands before breaks and after work. Remove soiled or soaked clothing immediately. Wash contaminated clothes before reuse. Do not eat, drink or smoke when handling this product. Remove contaminated clothing and protective equipment before entering eating areas.
7.3 Safe storage procedures
Keep away from heat. Keep containers tightly closed in a dry well ventilated place. Empty containers retain product residue and can be hazardous.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	OTHER LIMIST
Nonylphenol	84852-15-3	No data	No data	This product does not contain any hazardoud materials with occupational exposure limits established by the region specific regulatory bodies.
Polyoxyalkyleneamine	9046-10-0			Contains no substance with occupational

				exposure limit values.
Isophoronediamine	2855-13-2	Not Available	Not Available	Not Available
N-Aminoethylpiperazine	140-31-8	No data	No data	No data

AminoEthylPiperazine Derived- no-effect level (DNEL)*

End Use	Exposure Routes	Potential Health Effects	Value
Workers	Skin Contact	Acute Systemic Effects	20 mg/kg bw /day
Workers	Inhalation	Acute Systemic Effects	21.4 mg/m^3
Workers	Skin Contact	Acute Local Effects	0.04 mg/cm^2
Consumers	Skin Contact	Acute Systemic Effects	10 mg/kg bw/day
Consumers use	Inhalation	Acute Systemic Effects	5.3 mg/m^3
Consumers	Ingestion	Acute Systemic Effects	1.5 mg/kg bw/day
Consumers	Skin Contact	Acute Local Effects	0.02 mg/cm^2
Consumers	Skin Contact	Long-term Systemic Effects	1.7 mg/kg bw/day
Consumers	Inhalation	Long-term Systemic Effects	0.9 mg/cm^2
Consumers	Skin Contact	Long-term Systemic Effects	0.003 mg/cm^2
Workers	Inhalation	Long-term Systemic Effects	3.6 mg/m^3
Workers	Skin Contact	Long-term Systemic Effects	3.3 mg/kg bw /day

* Level of exposure to a substance above which humans should not be exposed.

8.2 EXPOSURE CONTROLS

ENGINEERING CONTROLS

Use local exhaust ventilation to maintain airborne concentrations at safe levels. Suitable respiratory equipment should be used in cases of insufficient ventilation or where demand it.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Equipment	: Wear a NIOSH-certified (or equivalent) organic vapour and ammonia / particulate respirator.
Eye Protection	: Use tightly fitting chemical splash goggles. Wear face shield if splashing hazard exists.
Hand Protection	: Use impermeable gloves. Neoprene or butyl-rubber gloves
Body Protection	: Use impervious clothing and chemical resistant boots. Consider using resistant coveralls and aprons, if extensive exposure is possible.
Other Protective Equipment	: Ensure that eyewash stations and safety showers are close to the workstation location.
General Hygiene Consideration	: Do not breathe mist or vapor. Avoid all contact. Do not eat, drink, or smoke when using this product. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Do not take contaminated clothes home.
Environmental Exposure Controls	: Avoid runoff into storm sewers and ditches which lead to waterways. May be hazardous to the environment if released in large quantities

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Physical State	: Liquid. (Oily liquid)
Color	: Clear, slightly yellow.
Odor	: Ammonia-like.
Odour Threshold	: Less than 0.1 ppm

Properties

Melting Point / Freezing point	: 10 ºC
Boiling Point	: 220 ºC
Flash Point	: 99 ºC
Evaporation Rate	: Slow
Upper explosive limit (%vol)	: 9.4 %
Lower explosive limit (%vol)	: 1.1 %
Vapour pressure (mm Hg)	: 0.015 hPa at 20 ºC
Relative vapour density (air=1)	: 4.5
PH	: 10
Specific Gravity	: 1.0 – 1.2 g/ cm^3
Viscosity	: 500 cP
VOC content	: 0
Solubility in water	: Negligible
Partition coefficient	: Log Pow: -1.48 at 20 ºC
Auto-Ignition temperature	: Greater than 300 ºC
Decomposition temperature	: 300 ºC

10 STABILITY AND REACTIVITY

Reactivity	: Will react with epoxy resins. Reaction generates heat. Pour on floor and apply, otherwise heat will concentrate in the container and may cause burns.
Chemical Stability	: Stable under normal conditions
Incompatibility with various substances	: Strong oxidizing agents, acids, halogenated compounds, ammonia, carbon monoxide, carbon dioxide, Aldehydes, ketones. Reacts also with copper, aluminum, zinc and their alloys.
Hazardous Polymerization	: Will not occur under normal conditions
Conditions to avoid	: High temperatures, Direct sunlight.

Hazardous decomposition products : Carbon dioxide, Carbon monoxide, nitrogen oxides.

11 TOXICOLOGICAL INFORMATION

11.1 Information on Likely Routes of Exposure

Routes of entry inhalation: Yes
Routes of entry skin & eye: Yes
Routes of exposure skin absorption: Yes

Symptoms:

It will irritate respiratory tract if inhaled for long time. It is corrosive so it will irritate and cause burns if in contact with skin or eyes. Can cause a rash that usually disappears after a few days.

11.2 Potential Health Effects

Signs and symptoms of short-term (acute) exposure

11.2.1Skin Corrosion and / or irritation

Nonylphenol	Corrosive to the skin. Causes burns
Polyoxyalkyleneamine	Corrosive to the skin. Causes burns
Isophoronediamine	Corrosive to the skin.
N-Aminoethylpiperazine	Symptoms may be delayed. Toxic in contact with skin. May cause an allergic skin reaction. Causes severe skin burns.

11.2.2Eye Damage or irritation

Nonylphenol	
Polyoxyalkyleneamine	Corrosive to eyes. Causes burns
Isophoronediamine	Species: Rabbit. Result: Risk of serious damage to eyes. Method: OECD guideline 405
N-Aminoethylpiperazine	Causes serious eye damage

11.2.3Respiratory and skin sensitization.

Nonylphenol	Route: Skin. Species: Guinea pig. Result: Not sensitizing.
Polyoxyalkyleneamine	Route: Skin. Species: Guinea pig. Result: Not sensitizing.
Isophoronediamine	Guinea pig sensitization test. Species: Guinea pig. Result: Sensitizing. Method: OECD guideline 406
N-Aminoethylpiperazine	May cause sensitization by skin contact

Potential Chronic Health Effects

Frequent or prolonged skin contact may dry the skin, leading to discomfort and dermatitis.

11.3 Germ cell mutagenicity

Nonylphenol	Test: OECD 476 in vitro Mammalian cell gene Mutation test Experiment: In vitro. Subject: Mammalian animal Metabolic activation:+/-. Result: Negative.
Polyoxyalkyleneamine	No known significant effects or critical hazards.
Isophoronediamine	Experimental / calculated data: Arnes-test. No mutagenic effects reported. Micronucleus assay: No mutagenic effects reported.
N-Aminoethylpiperazine	Genotoxicity in vitro: Arnes test result: Negative. Genotoxicity in vivo: Result: No evidence of genotoxic effects in vivo.

11.4 Carcinogenicity

For the ingredients in this product, No known significant effects or critical hazards.

11.5 Reproductive Toxicity

No known significant effects or critical hazards

11.6 Specific Target Organs Effect

May cause damage to the kidneys

11.7 Aspiration hazards

No aspiration hazard expected.

11.8 Toxicological Data

Ingredient Name	Test	Species	Result	Exposure
Nonyl Phenol	LD50 Dermal	Rabbit	2140 mg/Kg	
	LD50 Oral	Rat	580 mg/Kg	
	Sub-acute NOAEL Oral	Rat –Male, Female	100 mg/Kg	28 days; 7 days per week
	Sub-chronic NOAEL Oral	Rat – Male, Female	50 mg/Kg	28 days;
Polyoxyalkyleneamine	LD50 Dermal	Rabbit- Male, Female	2980 mg/Kg	
	LD50 Oral	Rat – Male, Female	2885 mg/Kg	
Isophoronediamine	LD50 Oral	Rat	1030 mg/Kg	
	Dermal		No data available	
N-Aminoethylpiperazine	LD50 Oral	Rat	2000 – 5000 mg/Kg	
	LD50 Dermal	Rabbit	200 – 1000 mg/Kg	

12 ECOLOGICAL INFORMATION

12.1 Environmental Effects :Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment. It is

biodegradable, but has a lot of potential for bioaccumulation. Water polluting material. May be harmful to the environment if released in large quantities.

12.2 Aquatic Ecotoxicity

Substance	Test	Result	Species	Exposure
NonylPhenol		Acute EbC50 (biomass)0.0563 mg/L Fresh water	Algae	72 hours Static
		Acute EC50 0.085 mg/L Fresh water	Daphnia	48 hours Static
		Chronic EbC10 0.0033 mg/L Fresh water	Algae	72 hours Static
		Chronic NOEC 0.0047 mg/L Fresh water	Fish	33 days
		Chronic NOEC 0.024 mg/L Fresh water	Daphnia	21 days Semi-static
Polyoxyalkyleneamine		Acute LC50>220 mg/L	Fish	96 hours
Isophoronediamine	Acute. Directive 84/449/EEC	LC50 :110 mg/L	Leuciscus idus	96 hours Semistatic
	Chronic	Study scientifically not justified	Fish	
	Acute OECD Guideline 202	EC50: 23 mg/L	Daphnia magna	48 hours Static
		EC50: 388 mg/L	Chaetogammarus marinus	48 hours Semi-static
	Chronic Directive: OECD Guideline202	NOEC: 3 mg/L	Daphnia magna	21 days
	Directive 88/301/EEC	EC50 > 50 mg/L	Green Algae	72 hours
	DIN 28412	EC10: 1120 mg/L	Bacterium	18 hours
N-Aminoethylpiperazine		LC50:>100 mg/L	Pimephales prometas (fathead minnow)	96 hours
		EC50> 10-100 mg/L	Daphnia magna (water flea)	48 hours
		EC50:> 100 mg/L	Pseudokirchneriella subcapitata (green algae)	72 hours

12.3 Persistence and degradability

Substance	Result	Method	Dose
Nonylphenol	62% inherent- 28 days	OECD Ready Biodegradability-Manometric Respirometry test	31 mg/L Oxygen consumption
	53% Inherent -28 days	OECD 301B Ready Biodegradability CO2 Evolution test	12.2 mg/L Carbon dioxide production
Polyoxyalkyleneamine	7.23% Inherent-28 days	OECD 301B Biodegradability-CO2 Evolution Test	Inoculum: Activated sludge
Isophoronediamine	Not readily biodegradable by OECD Criteria	Directive 92/69 EEC, C.4-A (aerobic) DOC Reduction.	Degree of elimination: 8% (28 days)
N-Aminoethylpiperazine	Not readily biodegradable	OECD Test Guideline 301D	

12.4 Bioaccumulation

Nonylphenol	LogPow: 3.8 to 4.77	Potential: High
Polyoxyalkyleneamine	No data available	
Isophoronediamine	Based on the Log Pow	Accumulation in organisms is not to be expected.
N-Aminoethylpiperazine	No data available	

12.5 Mobility in Soil

Nonylphenol	No Data Available
Polyoxyalkyleneamine	No Data Available
Isophoronediamine	Transport between environmental compartments: Calculated Adsorption/water – soil KOC: 928 log KOC: 2.97
N-Aminoethylpiperazine	No Data Available

12.6 Other Adverse effects

Substance	
Isophorenediamine	Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
N-AminoEthylpiperazine	Biochemical Oxygen Demand (BOD) <60 % BOD, 28 days, Closed Bottle Test (OECD 301D)

13 DISPOSAL CONSIDERATIONS

Waste Disposal Method

Incinerate or dispose of unused material, residues and containers in a licensed facility in accordance with all applicable local, state and federal regulations. Do not discharge substance/product into sewage system. Do not contaminate pond, waterways or ditches with chemical or used container. The product should not be allowed to enter drains, water courses or the soil.

14 TRANSPORT INFORMATION

14.1 Identification, UN number : UN 2735
14.2 Shipping Name : Amines Liquid, Corrosive, N.O.S
14.3 Hazard Class : 8
14.4 Packing Group : III

15 REGULATORY INFORMATION.

DSL: All Ingredients are listed under the Canada DSL
This product has been classified in accordance with the hazard criteria of the controlled products regulations and the SDS contains all the information required by it.

16 OTHER INFORMATION

Preparation Date	:Dec 10, 2024.
SDS prepared by	: Polymer Science Corp. 403 287 2751

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