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Effective Date: 1/19/05

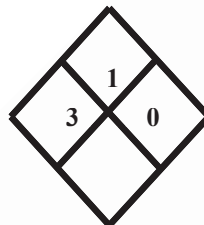
Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Trade Name: 4:1 EPOXY HARDENER

Chemical Family: Phenolic Modified Polyamine

Intended Use: Curing Agent



NFPA RATING

Health:	3*
Flammability:	1
Reactivity:	0
Personal Protection:	

HMIS RATING

2. COMPOSITION / INFORMATION ON INGREDIENTS

O S H A	CAS No.	CHEMICAL IDENTITY	EXPOSURE LIMITS				CARCINOGEN STATUS			
			ACGIH		OSHA		MFR.	IARC	NTP	OSHA
			TWA	STEL	PEL	STEL				
*	108-95-2 Common Name: Concentration	Phenol Phenol 9.00 - 11.00 % by wt	5 ppm	NE	5 ppm	NE	NE	NR	NR	NR
*	32610-77-8 Common Name: Concentration	Formaldehyde, polymer with N,N'-bis(2-aminoethyl)-1,2-ethanediamine and phenol Phenolic Modified Polyamine 87.00 - 89.00 % by wt	NE	NE	NE	NE	NE	NR	NR	NR
*	50-00-0 Common Name: Concentration	Formaldehyde Formaldehyde < 2.00 % by wt	NE	0.3 ppm	.75 ppm	2 ppm	NE	Yes	Yes	Yes

NE = Not Established NR = Not Reviewed * = OSHA Hazardous Ingredient

Reference Notes: Refer to Section 8, Subheading "Exposure Guidelines", for additional information concerning exposure limits.

3. HAZARDS IDENTIFICATION

Emergency Overview: Appearance: Light Straw Colored Liquid Ammonia or amine odor
 CORROSIVE to skin and eyes.
 TOXIC by skin absorption, inhalation and ingestion.
 May cause skin and respiratory sensitization.

Route(s) of Entry: Eye contact, ingestion, inhalation, and skin contact. Skin absorption.

Acute Exposure: EYES: CORROSIVE. Direct contact with eyes will cause severe burns and may cause permanent damage, including blindness.

INGESTION: TOXIC. This material may be fatal if swallowed. Corrosive and may cause severe and permanent damage to mouth, throat, and stomach.

INHALATION: Harmful if inhaled. Inhalation of vapor or aerosol may cause severe irritation to the respiratory tract (nose, throat, and lungs). Exposure to high concentrations could result in severe respiratory irritation, liver and kidney damage, and even death. May cause respiratory sensitization in susceptible individuals.

SKIN: CORROSIVE. Contact causes skin burning and may cause permanent skin damage (scarring). Contact may cause skin sensitization, an allergic reaction which becomes evident on re-exposure to this material. Toxic if absorbed through skin.

Chronic Exposure: Chronic phenol poisoning in industry is rare. Symptoms have however included vomiting, difficulty swallowing, loss of appetite, dermatitis, dark urine, discolored skin, general weakness, loss of body weight, enlarged liver and kidney damage.

Carcinogenicity: This material contains formaldehyde which is listed by the International Agency for Research on Cancer (IARC) as a group 1 cancer causing agent (carcinogenic to humans). Formaldehyde is listed by the National Toxicology Program (NTP) as reasonably anticipated to be a carcinogen. It is also listed by the American Conference of Governmental Industrial Hygienists (ACGIH) as a suspected human carcinogen (Group A2). The US Occupational Safety and Health Administration (OSHA), in its formaldehyde standard (29 CFR 1910.1048), considers formaldehyde a carcinogen.

4. FIRST AID MEASURES

Eye Contact: Move individual away from exposure. Immediately flush eyes with large quantities of clean water for at least 15 minutes. Get immediate medical attention.

Skin Contact: Immediately flush skin with water for at least 15 minutes while removing contaminated clothing. Get immediate medical attention. Wash contaminated clothing before reuse or discard the contaminated clothing (See Section 13 for Disposal Considerations).

Ingestion: DO NOT INDUCE VOMITING. CORROSIVE HAZARD: this material may cause further damage if vomiting is induced. Immediately give the victim one or two glasses of water or milk to drink. Never give anything by mouth to an unconscious person. GET IMMEDIATE MEDICAL ATTENTION.

Inhalation: Remove victim to fresh air. Keep warm and quiet. If not breathing, give artificial respiration. If breathing is difficult, give oxygen by trained personnel. GET IMMEDIATE MEDICAL ATTENTION.

5. FIRE FIGHTING MEASURES

Flash Point:	> 200° F (> 93 °C)
Flash Point Method Used:	SetaFlash Closed Cup
Flammable Limits in Air (Lower):	Not available
Flammable Limits in Air (Upper):	Not available
Autoignition:	Not available

General Hazards: Containers of this material may build up pressure if exposed to heat (fire). See information in Fire Fighting Instructions (below) in this section.

Fire Fighting Extinguishing Media: Use carbon dioxide, foam, dry chemical or water fog to extinguish fire.

Fire Fighting Equipment: Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing. Thoroughly decontaminate all protective equipment after use.

Fire Fighting Instructions: Evacuate all persons from the fire area to a safe location. Move non-burning material, as feasible, to a safe location as soon as possible. Fire fighters should be protected from potential explosion hazard while extinguishing the blaze. Containers of this material may build up pressure if exposed to heat (fire). Use water spray to cool fire-exposed containers.

Fire and Explosion Hazards: Closed containers may rupture when exposed to extreme heat. Empty containers may retain product residue (liquid and/or vapor). Do not pressurize, cut, weld, braze, solder, drill, grind, or expose these containers to heat, flame, sparks, static electricity, or other sources of ignition as the container may explode and may cause injury or death.

Hazardous Combustion Products: Combustion may produce carbon monoxide, carbon dioxide and irritating or toxic vapors and gases. Oxides of nitrogen. Formaldehyde

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: FOR SMALL SPILLS: Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.

LARGE SPILL: Persons not wearing protective equipment (see Section 8) should be excluded from the area of the spill until clean-up has been completed. Prevent spilled material from 1) contaminating soil, 2) entering sanitary sewers, storm sewers, and drainage systems, and 3) entering bodies of water or ditches that lead to waterways. Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.

7. HANDLING AND STORAGE

Signal Word: D A N G E R

Handling Information: Avoid inhalation and contact with eyes, skin, and clothing. Wash hands thoroughly after handling and before eating or drinking. Remove and wash contaminated clothing before reuse. Use with adequate ventilation.

Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner or properly disposed.

Storage Information: Keep container closed when not in use. Store in a cool, well ventilated space away from incompatible materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines: The Occupational Safety and Health Administration (OSHA), has established for formaldehyde, a Permissible Exposure Limit (PEL) of 0.75 ppm for an 8 hour Time Weighted Average (TWA) and a 0.5 ppm action level. Refer to 29 CFR 1910.1048 for more information. The American Conference of Governmental Industrial Hygienists (ACGIH) has established, for formaldehyde, a Short Term Exposure Limit (STEL) / Ceiling Concentration for a 15 minute exposure of 0.3 ppm.

The Occupational Safety and Health Administration (OSHA), has established for phenol, a Permissible Exposure Limit (PEL) of 5 ppm with a skin notation an 8 hour Time Weighted Average (TWA). The American Conference of Governmental Industrial Hygienists (ACGIH) has established, for phenol, a Threshold Limit Value (TLV) of 5 ppm Time Weighted Average (TWA) with a skin notation for an 8-hour workday and a 40-hour work week.

Engineering Controls: Use general ventilation to maintain airborne concentrations to levels that are below regulatory and recommended occupational exposure limits. See occupational exposure limits in Section 2. Local ventilation may be required during certain operations to maintain concentrations below recommended exposure limits.

Eye Protection: Wear 1) safety glasses with side shields and a faceshield or 2) goggles and a faceshield. Facilities storing or utilizing this material should be equipped with an eyewash station and safety shower.

Skin Protection: Wear chemical resistant gloves. If splashing is likely, wear impervious clothing and boots to prevent repeated or prolonged skin contact. Consult your supplier of personal protective equipment for additional instructions on proper usage.

Respiratory Protection: A NIOSH/MSHA approved air purifying respirator with organic vapor cartridge or canister may be necessary under certain circumstances where airborne concentrations are expected to exceed exposure limits. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Protection provided by air purifying respirators is limited. Use a positive pressure air-supplied respirator if 1) there is any potential for an uncontrolled release, 2) exposure levels are not known, or 3) during other circumstances where air purifying respirators may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Straw colored
Odor:	Amine
Odor Threshold:	Not available
Physical State:	Liquid
Solubility in Water:	Not available
Viscosity:	4500 cps at 25°C (77 °F)
Vapor Pressure:	Not available
Specific Gravity:	1.078 (Water = 1) at 25°C (77 °F)
Boiling Point:	Not available
Freezing Point:	Not available
Evaporation Rate:	Not available
Vapor Density:	> 1 (AIR=1)
% Volatile:	12 % by weight
VOC Content:	129 grams/liter (calculated)product as supplied
pH:	Not available

10. STABILITY AND REACTIVITY

Stability: This material is stable during storage and during its intended use.

Incompatibility: Phenol attacks copper, aluminum, magnesium, lead, zinc, iron and their alloys. It can form dangerous exothermic reactions and possible explosive reactions with strong oxidizers, peroxymonosulfuric acid, sodium nitrate, calcium hypochlorite, 1,3-butadiene and boron trifluoride diethyl ether.

Hazardous Decomposition Products: Thermal decomposition may form: carbon monoxide, carbon dioxide, and various hydrocarbons. Nitrogen oxides Phenols

Hazardous Polymerization: Hazardous polymerization will NOT occur.

Conditions to Avoid: Ignition sources. Contamination by those materials referred to under Incompatibility.

11. TOXICOLOGICAL INFORMATION

Acute Eye Toxicity: Phenol: Causes severe irritation, burns and possible corneal damage. Formaldehyde causes severe eye irritation.

Acute Skin Toxicity: Phenol: dermal LD50 (rabbit), 850 mg / kg. Formaldehyde: dermal LD50 (rabbit), 270 mg / kg.

Acute Inhalation Toxicity: Phenol: inhalation LC50 (rat), 316 mg / cu m Formaldehyde: Inhalation LC50 (rat), 250 - 590 mg / cu m.

Acute Oral Toxicity: Phenol: oral LD50 (rat) 317 mg / kg. Formaldehyde: oral LD50 (rat) 100 mg / kg.

Chronic/Carcinogenicity: Phenol meets the Registry of Toxic Effects of Chemical Substances (TRECS) criteria as carcinogenic and neoplastic.

The American Conference of Governmental Industrial Hygienists (ACGIH) has adopted the listing of Phenol as "A4-Not Classifiable as a Human Carcinogen." There is inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

The International Agency for Research on Cancer (IARC) has classified Phenol in Group 3, not classifiable as to its carcinogenicity to humans.

Phenols have been implicated in the formation of Heinz bodies in many animal species. Inhalation of phenol was related to stimulation of the central nervous system, followed by severe depression. Exposure of animals to phenol resulted in paralysis in some animal species, but not others.

Formaldehyde is classified as a 2A (probable human carcinogen) by the International Agency for Research on Cancer (IARC).

The National Toxicology Program (NTP) has listed formaldehyde as a substance that may reasonably be anticipated to be a human carcinogen.

Formaldehyde is classified as a carcinogen by the Occupational Safety and Health Administration (OSHA).

The American Conference of Governmental Industrial Hygienists (ACGIH) has adopted the listing of Formaldehyde as "A2-Suspected Human Carcinogen."

There is human data that show statistically significant associations between site-specific respiratory neoplasms and exposure to formaldehyde or formaldehyde-containing products. An increased incidence of nasal squamous cell carcinomas was observed in long-term inhalation studies in rats and mice.

Sensitization: Overexposure to formaldehyde has been suggested as a cause of skin and respiratory sensitization in humans.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Phenol: LC50 (fathead minnow), 32 mg / L / 96hr; (rainbow trout), 5.6 - 11.3 mg / L / 24 hr.
Formaldehyde: LC50 (rainbow trout), 440 mg / L / 96 hr.

Environmental Fate: Phenol is considered highly toxic to aquatic life. If phenol is released to soil, it will rapidly biodegrade. Some of the phenol spilled will evaporate into the atmosphere. Released into water, phenol is not expected to significantly hydrolyze, adsorb to sediment or bioconcentrate in aquatic organisms. It is expected to biodegrade. Released to the atmosphere, phenol will predominately exist in the vapor phase. It absorbs light and may therefore directly photodegrade.

Formaldehyde, when released to soil, is biodegradable under aerobic and anaerobic conditions. In water, formaldehyde will biodegrade. Little adsorption to sediment would be expected. When released to the atmosphere, formaldehyde will both photolyze and react rapidly with reactive free radicals.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Not a RCRA hazardous waste. Disposal of this material is not regulated under RCRA. Consult federal, state and local regulations to ensure that this material and its containers, if discarded, is disposed of in compliance with all regulatory requirements.

"Empty containers", as defined under 40 CFR 261.7 or other applicable state or provincial regulations or transportation regulations, are not classified as hazardous wastes.

RCRA Hazard Class: NOT A RCRA HAZARDOUS WASTE: When discarded in its purchased form, this material would not be regulated as a RCRA Hazardous waste under 40 CFR 261.

14. TRANSPORT INFORMATION

DOT: Bulk and Non-Bulk

Proper Shipping Name:	CORROSIVE LIQUID, TOXIC, N.O.S.
Technical Shipping Name (If n.o.s.):	POLYAMINES, PHENOL
Hazard Class:	8(6.1)
ID Number:	UN2922
Packing Group:	II
ERG Number:	154

TDG: Bulk and Non-Bulk

Proper Shipping Name:	CORROSIVE LIQUID, TOXIC, N.O.S.
Technical Shipping Name (If n.o.s.):	POLYAMINES, PHENOL
Hazard Class:	CLASS 8(6.1)
ID Number:	UN2922
Packing Group:	PG II
ERG Number:	154

IATA: Non Bulk

Proper Shipping Name:	CORROSIVE LIQUID, TOXIC, N.O.S.
Technical Shipping Name (If n.o.s.):	POLYAMINES, PHENOL
Hazard Class:	8(6.1)
ID Number:	UN2922
Packing Group:	II
ERG Number:	154

IMDG: Bulk and Non-Bulk

Proper Shipping Name:	CORROSIVE LIQUID, TOXIC, N.O.S.
Technical Shipping Name (If n.o.s.):	POLYAMINES, PHENOL
Hazard Class:	CLASS 8(6.1)
ID Number:	UN2922
Packing Group:	PG II
ERG Number:	154

15. REGULATORY INFORMATION

Occupational Safety and Health Act (OSHA): This material is classified as a hazardous chemical under the criteria of the US Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III: Section 302 - Extremely Hazardous Substances (EHS): Phenol (CAS# 108-95-2) Formaldehyde (50-00-0)

SARA Title III: Section 304 - CERCLA: Phenol (CAS# 108-95-2): Reportable Quantity = 1,000 lb. Formaldehyde (CAS# 50-00-0): Reportable Quantity = 100 lb.

SARA Title III: Section 311/312 - Hazard Communication Standard (HCS): This material is classified as an IMMEDIATE HEALTH HAZARD and DELAYED HEALTH HAZARD under the US Superfund Amendment and Reauthorization Act (Section 311/312).

SARA Title III: Section 313 Toxic Chemical List (TCL): Phenol (CAS# 108-95-2) Formaldehyde (50-00-0)

TSCA Section 8(b) - Inventory Status: All components of this material are listed on the US Toxic Substances Control Act (TSCA) inventory.

TSCA Section 12(b) - Export Notification: This material does not contain any components that are subject to the US Toxic Substances Control Act (TSCA) Section 12(b) Export Notification requirements.

Australian Inventory Status: This product contains only chemicals which are currently listed on the Australian Inventory of Chemical Substances.

Canadian Inventory Status: All components of this material are listed on the Canadian Domestic Substances List (DSL).

Canadian WHMIS: This material is classified by the Canadian Workplace Hazardous Material Information System as: D1A (materials causing immediate and serious toxic effects, very toxic material) D1B (materials causing immediate and serious toxic effects, toxic material) D2A (materials causing other toxic effects, very toxic material) D2B (materials causing other toxic effects, toxic material) E (corrosive material)

European Inventory Status (EINECS): All components are either listed or are exempt from being listed, on the EINECS chemical inventory. The polymer portion of this product is manufactured from reactants which are listed on EINECS and meets the EINECS definition of an exempt polymer.

Korean Inventory Status: This product contains only chemicals which are currently listed on the Korean Chemical Substances List.

California Proposition 65: W A R N I N G: This material contains a chemical known to the State of California to cause cancer. The California Safe Drinking Water and Toxic Enforcement Act of 1986 requires that clear and reasonable warning be given prior to exposing any person to this chemical: Formaldehyde (CAS# 50-00-0)

Additional Canadian Regulatory Information: This product contains the following chemical(s) listed on the WHMIS Ingredient Disclosure List at or above the specified concentration limit: Phenol (CAS# 108-95-2) Formaldehyde (CAS#50-00-0)

16. OTHER INFORMATION

MSDS

Reason Issued:

Updates to several sections

Prepared By:

Product Safety & Compliance Department

Approved By:

Title:

Supersedes Date:

06/12/01

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