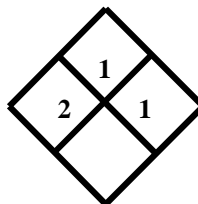


P.O. Box 4980
The Woodlands, TX 77387-4980

8 am to 5 pm Phone: (800) 257-5547
24-Hour Emergency Phone: (800) 328-8501
International Emergency Phone: (409) 727-0831
Asia Pacific Emergency Phone: (65) 6336-6011

Effective Date: 7/28/08**Material Safety Data Sheet**

MSDS No: 62184

1. PRODUCT IDENTIFICATION**Trade Name:** Epocast 50-A1**Material Code:** FPC7353**Chemical Family:** Epoxy Resin**Intended Use:** Adhesive

NFPA RATING

Intended Use or Product Type: This material is free of Polybrominated Diphenyl Ethers (PBDEs) including penta-, octa-, and deca-PBDEs, or related compounds such as Polybrominated Biphenyl (PBB).

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				
*	1330-78-5	PHOSPHORIC ACID, TRIS(METHYLPHENYL) ESTER Tricresyl Phosphate Common Name: Concentration 10.00 - 30.00 % by wt	NE	NE	NE	NE	NE	NR	NR	NR
*	25085-99-8	Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, homopolymer bisphenol A diglycidyl ether resin Common Name: Concentration 30.00 - 60.00 % by wt	NE	NE	NE	NE	NE	NR	NR	NR
	28064-14-4	Phenol, polymer with formaldehyde, glycidyl ether Phenol-formaldehyde polymer glycidyl ether 30.00 - 60.00 % by wt Common Name: Concentration	NE	NE	NE	NE	NE	NR	NR	NR
	181186-39-0	silsequioxanes, Ph-, hydroxy-terminated Phenyl hydroxy-terminated silsequioxanes 10.00 - 30.00 % by wt Common Name: Concentration	NE	NE	NE	NE	NE	NR	NR	NR
	Confidential	nonhalogenated flame-retardant 10.00 - 30.00 % by wt Concentration	NE	NE	NE	NE	NE	NR	NR	NR

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

3. HAZARDS IDENTIFICATION

Emergency Overview: Warning! Causes severe eye irritation. Causes skin irritation. May cause eye burns and allergic skin reaction.

Primary Route(s) of Entry: Dermal, inhalation.

Potential Health Effects: Vapor or mist may possibly be harmful if inhaled. Substance may cause moderate irritation to eyes. Substance may cause slight irritation to skin. Substance may possibly be harmful if ingested.

Carcinogenicity (NTP, IARC, OSHA): The chemicals listed in Section 2 are not considered to be carcinogenic by NTP, IARC, or OSHA.

Chronic: Prolonged and repeated exposure can cause allergic reaction. Also, prolonged repeated exposure of substance may cause delayed and serious injury.

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

Skin: Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes. Seek immediate medical attention.

Inhalation: Remove to fresh air. Seek immediate medical attention.

Eyes: Immediately flush eyes with water for at least 15 minutes. Seek immediate medical attention.

Note to Physician: Allergic dermatitis or respiratory response in susceptible individuals may be delayed. It may appear after weeks or even months of frequent and prolonged contact.

Medical Conditions Aggravated by Exposure: Allergy, skin or eyes conditions.

5. FIRE FIGHTING MEASURES

Flash Point: > 200°C (> 392 °F) (estimated)

Fire Fighting Extinguishing Media: Carbon dioxide, dry chemical, foam, water.

Fire Fighting Equipment: Use self-contained breathing apparatus and full protective clothing.

Fire and Explosion Hazards: Keep fire-exposed containers cool with water.

Hazardous Combustion Products: Decomposition and combustion products may be toxic.

Effective Date: 7/28/08

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Clean up all traces of spill. Shovel as much of material as possible into clean, dry containers. On hard surface use absorbent material to pick up remainder: on loose surfaces shovel up contaminated layer.

7. HANDLING AND STORAGE

Signal Word: Caution!

Precautions: Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally.

Other Handling Information: In accordance with good industrial practice, handle with care and avoid unnecessary personal contact. Avoid contact with eyes and prolonged or repeated skin contact. Do not inhale mists. Use with adequate ventilation. For industrial use only.

Storage Information: STORAGE TEMPERATURE: 35 deg C, maximum. Store indoors in a cool, dry area with adequate ventilation.

Additional Information: PLEASE READ TECHNICAL DATA SHEET BEFORE HANDLING THE PRODUCT. KEEP OUT OF THE REACH OF CHILDREN. FOR INDUSTRIAL USE ONLY.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protective Equipment: Eye bath and safety shower should be available. Wear protective clothing.

Exposure Guidelines: Wash thoroughly after handling and before eating, drinking, or using tobacco products.

Skin Protection: Wear impervious gloves.

Respiratory Protection: Wear respirator (MSHA/NIOSH or approved equivalent) suitable for concentrations and type of air contaminants encountered.

Eye Protection: Wear safety glasses or goggles.

Engineering Controls: Good general mechanical ventilation and local exhaust if needed.

Emergency Response Protection: Wear breathing apparatus (MSHA/NIOSH-approved, pressure demand, self-contained or equivalent) and full protective gear.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquid
Odor:	Slight
Viscosity:	7770 cps at 25°C (77 °F)
Vapor Pressure:	< 1 mm Hg at 20°C (68 °F)
Specific Gravity:	1.21 (Water =1)
Evaporation Rate:	< 1 (Butyl Acetate = 1)
VOC:	12 g/L (This is an estimated value.)

10. STABILITY AND REACTIVITY

Conditions to Avoid: Elevated temperatures, strong acids, and amines in bulk.

Stability: Stable under normal conditions.

Incompatibility: Strong oxidizers and acids.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, aldehydes, oxides of nitrogen, phosphoric acid

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Sensitization: May cause allergic skin reaction and sensitization.

Skin Irritation: Slight irritation.

Eye Irritation: Moderate irritant.

12. ECOLOGICAL INFORMATION

Biodegradability: No information available.

Ecotoxicity: No information available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in approved equipment. Landfill or incinerate contaminated material in accordance with local, state, and federal regulations.

14. TRANSPORT INFORMATION**DOT: Non-Bulk**

Proper Shipping Name:	Environmentally hazardous substance, liquid, n.o.s.
Technical Shipping Name (If n.o.s.):	tricresyl phosphate solution containing < 1% ortho isomer
Hazard Class:	9
ID Number:	UN 3082
Packing Group:	PG III
Marine Pollutant:	Marine Pollutant

IATA: Non-Bulk

Proper Shipping Name:	Not Regulated
------------------------------	---------------

TDG: Non-Bulk

Proper Shipping Name:	Environmentally hazardous substance, liquid, n.o.s.
Technical Shipping Name (If n.o.s.):	tricresyl phosphate solution containing < 1% ortho isomer
Hazard Class:	9
ID Number:	UN 3082
Packing Group:	PG III

Effective Date: 7/28/08

Marine Pollutant:	Marine Pollutant
IMDG: Non-Bulk	
Proper Shipping Name:	Environmentally hazardous substance, liquid, n.o.s.
Technical Shipping Name (If n.o.s.):	tricesyl phosphate solution containing < 1% ortho isomer
Hazard Class:	9
ID Number:	UN 3082
Packing Group:	PG III
Marine Pollutant:	Marine Pollutant

Department of Transportation: Under 49 CFR 171.4 (c) NONBULK shipments of marine pollutants are not regulated for transport by motor vehicles, rail cars or aircraft. NONBULK shipments of marine pollutants are regulated when transported by vessel (ship).

15. REGULATORY INFORMATION

US Federal Regulations:

Occupational Safety and Health Act (OSHA): This Material Safety Data Sheet (MSDS) has been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.

SARA Title III: Section 302 - Extremely Hazardous Substances (EHS): This product does not contain any chemicals regulated under Section 302 (40 CFR 355) as extremely hazardous substances.

SARA Title III: Section 304 - CERCLA: This product does not contain any chemicals regulated under Section 304 (40 CFR 302) as hazardous chemicals for emergency release notification ("CERCLA" List).

SARA Title III: Section 311/312 - Hazard Communication Standard (HCS): Immediate (acute) health hazard
Delayed (chronic) health hazard

SARA Title III: Section 313 Toxic Chemical List (TCL): This product does not contain a toxic chemical for routine annual 'Toxic Chemical Release Reporting' under Sec. 313 (40 CFR 372).

TSCA Section 8(b) - Inventory Status: All chemical(s) comprising this product are either exempt or listed on the TSCA inventory.

TSCA Section 12(b) - Export Notification: This product does not contain any chemical(s) that are subject to a Section 12(b) export notification.

International Regulations:

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

Canadian Inventory Status: This product contains only chemicals that are currently listed on the Canadian Domestic Substance List.

Canadian WHMIS: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. D2B

Effective Date: 7/28/08

European Inventory Status (EINECS): This product contains only chemicals that are currently listed on the European Inventory of Existing Commercial Chemical Substances (EINECS).

Japanese Inventory Status: This product contains one or more chemicals currently not on the Japanese Ministry of International Trade and Industry List of Existing and New Chemical Substances.

State Regulations:

California Proposition 65: The following is required composition information. This product contains the following chemical(s) which are currently listed on the California list of Known Carcinogens and Reproductive Toxins:

Chemical Name: Benzene, methyl-

Common Name: Toluene

CAS Number: 108-88-3

Percent in Composition: 0.01 - 0.05 % by wt

Comment: Warning! This chemical is known to the State of California to cause birth defects or other reproductive harm.

Chemical Name: BENZENE, ETHYL-

Common Name: ethyl benzene

CAS Number: 100-41-4

Percent in Composition: 0.01 - 0.05 % by wt

Comment: Warning! This chemical is known to the State of California to cause cancer.

Pennsylvania Right-to-Know: The following is required composition information:

Chemical Name: Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, homopolymer

Common Name: bisphenol A diglycidyl ether resin

CAS Number: 25085-99-8

Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: Phenol, polymer with formaldehyde, glycidyl ether

Common Name: Phenol-formaldehyde polymer glycidyl ether

CAS Number: 28064-14-4

Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: nonhalogenated flame-retardant

CAS Number: Confidential

Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: silsesquioxanes, Ph-, hydroxy-terminated

Common Name: Phenyl hydroxy-terminated silsesquioxanes

CAS Number: 181186-39-0

Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: PHOSPHORIC ACID, TRIS(METHYLPHENYL) ESTER

Common Name: Tricresyl Phosphate

CAS Number: 1330-78-5

Comment: Not on Pennsylvania Hazardous Substance List

16. OTHER INFORMATION

MSDS No:

62184

Reason Issued:

7/08 add syn, CA65, FP, WHMIS - 10/07

Printed: 7/28/2008

Page 6 of 7

Effective Date: 7/28/08

update - add syn 10/06 - change name -
New product
Matthew Austin
EH&S Chemist
10/05/07

Approved By:

Title:

Supersedes Date:

Other Information: L/M Code: D/CA3 (D10020033) [D04]
Material Code: FPC7353



Material Safety Data Sheet

HARDENER 946 US

1. Product and company identification

Product name : HARDENER 946 US
Material uses : Adhesive system
MSDS # : 00058221
Validation date : 6/18/2011.
Print date : 6/18/2011.

Supplier/Manufacturer : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

E-Mail: MSDS@huntsman.com

In case of emergency : Chemtrec: (800) 424-9300 or (703) 527-3887

2. Hazards identification

Physical state : Liquid.

Odor : Amine-like.

Color : Amber.

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

Emergency overview : DANGER!

CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN.
CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC
RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED.
CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON
ANIMAL DATA.

Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing.
Use only with adequate ventilation. Keep container tightly closed and sealed until ready
for use. Wash thoroughly after handling.

See toxicological information (Section 11)

GENERAL INFORMATION : Read the entire MSDS for a more thorough evaluation of the hazards.

3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
diethylenetriamine	111-40-0	30 - 60
4,4'-isopropylidenediphenol	80-05-7	30 - 60
2-aminoethanol	141-43-5	7 - 13

4 . First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Notes to physician** : Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

5 . Fire-fighting measures

- Flash point** : Closed cup: >100°C (>212°F)
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : 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.

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. Put on appropriate personal protective equipment (see Section 8).
- 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).
- Methods for cleaning up** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. 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.
- 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 (see section 10) and food and drink. 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

Ingredient	Exposure limits
diethylenetriamine	ACGIH TLV (United States, 2/2010). Absorbed through skin. TWA: 1 ppm 8 hour(s). TWA: 4.2 mg/m ³ 8 hour(s).
2-aminoethanol	ACGIH TLV (United States, 2/2010). TWA: 3 ppm 8 hour(s). TWA: 7.5 mg/m ³ 8 hour(s). STEL: 6 ppm 15 minute(s). STEL: 15 mg/m ³ 15 minute(s). OSHA PEL (United States, 11/2006). TWA: 3 ppm 8 hour(s). TWA: 6 mg/m ³ 8 hour(s).

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : 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.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Personal protection**
- Respiratory** : In case of inadequate ventilation wear respiratory protection. 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.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber

8 . Exposure controls/personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- 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.

9 . Physical and chemical properties

General information

Appearance

- Physical state** : Liquid.
- Color** : Amber.
- Odor** : Amine-like.

Important health, safety and environmental information

- pH** : Not available.
- Boiling/condensation point** : 207°C (404.6°F)
- Melting/freezing point** : Not available.
- Flash point** : Closed cup: >100°C (>212°F)
- Flammable limits** : Not available.
- Auto-ignition temperature** : Not available.
- Vapor pressure** : <0.13 kPa (<0.975 mm Hg) [20°C]
- Specific gravity** : Not available.
- Water solubility** :
- Partition coefficient: n-octanol/water (log Kow)** : Not available.
- Viscosity** : Dynamic: 400 mPa·s (400 cP)
- Density** : 1.05 g/cm³ [25°C (77°F)]
- Vapor density** : Not available.
- Evaporation rate (butyl acetate = 1)** : Not available.
- VOC** : Not available.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : strong acids, strong bases, strong oxidising agents
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

- Inhalation** : Irritating to respiratory system. May cause sensitization by inhalation.
- Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.
- Skin** : Corrosive to the skin. Causes burns. Toxic in contact with skin. May cause sensitization by skin contact.
- Eyes** : Corrosive to eyes. Causes burns.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
diethylenetriamine	LD50 Dermal	Rabbit	672 to 1240 mg/kg	-
	LD50 Oral	Rat	1080 to 2330 mg/kg	-
4,4'-isopropylidenediphenol	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-isopropylidenediphenol	Sub-chronic NOAEL Oral	Dog - Male, Female	75 mg/kg	90 days; 7 days per week
	Sub-chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	10 mg/m ³	13 weeks; 6 hours per day

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
diethylenetriamine	skin	Guinea pig	Sensitizing

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-isopropylidenediphenol	Negative - Oral - NOAEL	Rat - Male, Female	-	103 weeks; 7 days per week

Mutagenicity

Product/ingredient name	Test	Experiment	Result
4,4'-isopropylidenediphenol	-	Experiment: In vitro Subject: bacteria/yeast Metabolic activation: +/-	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-isopropylidenediphenol	Negative - Oral	Rat - Female	640 mg/kg NOAEL	-

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
4,4'-isopropylidenediphenol	-	-	-	Rat - Male, Female	Oral: 5 mg/kg NOAEL	7 days per week

Potential chronic health effects

11 . Toxicological information

- Chronic effects** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Target organs** : Contains material which may cause damage to the following organs: kidneys, liver.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure

Pre-existing respiratory and skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

12 . Ecological information

- Environmental effects** : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
4,4'-isopropylidenediphenol	-	Acute EC50 3.9 to 10.2 mg/L	Daphnia	48 hours
	-	Acute EC50 2.5 to 3.1 mg/L	Algae - Green algae	96 hours
	-	Acute LC50 7.5 mg/L	Fish - Rainbow trout (Oncorhynchus mykiss, Salmo gairdneri)	96 hours

Biodegradability

Product/ingredient name	Test	Result	Dose	Inoculum
4,4'-isopropylidenediphenol	-	1 to 2 % - Not readily - 28 days	-	-

Other ecological information

Not Determined
Not Determined

<u>Product/ingredient name</u>	<u>Aquatic half-life</u>	<u>Photolysis</u>	<u>Biodegradability</u>
4,4'-isopropylidenediphenol	-	-	Not readily

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

- PBT** : Not applicable.

Other information

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14 . Transport information





Proper shipping name

DOT : Amines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE) (ETHANOLAMINE)

TDG : Amines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE) (ETHANOLAMINE)

IMDG : Amines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE) (ETHANOLAMINE)

IATA : Amines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE) (ETHANOLAMINE)

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN2735	8	II		-
TDG Classification	UN2735	8	II		-
IMDG Class	UN2735	8	II		Emergency schedules (EmS) F-A, S-B
IATA-DGR Class	UN2735	8	II		Passenger and Cargo Aircraft Quantity limitation: 1 L Packaging instructions: 851 Cargo Aircraft Only Quantity limitation: 30 L Packaging instructions: 855

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations

- HCS Classification** : Toxic material
Corrosive material
Sensitizing material
Target organ effects
- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.
- TSCA 5(a)2 final significant new use rule (SNUR)** : None.
- TSCA 5(e) substance consent order** : None.
- TSCA 12(b) one-time export notification:** : None.
- TSCA 12(b) annual export notification** : None.
- SARA 302/304/311/312 extremely hazardous substances** : **SARA 302/304/311/312 extremely hazardous substances**: No Ingredient Listed
- SARA 311/312 hazard identification** : **SARA 311/312 MSDS distribution - chemical inventory - hazard identification:**
ETHANOLAMINE (RM LEAD): Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; 4,4'-isopropylidenediphenol: Immediate (acute) health hazard, Delayed (chronic) health hazard; diethylenetriamine: Immediate (acute) health hazard

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Product name CAS number Concentration
No Ingredients Listed.

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

<u>SARA 313</u>	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: 4,4'-isopropylidenediphenol	80-05-7	30 - 60

CERCLA: Hazardous substances: No ingredients listed.

STATE REGULATIONS:

PENNSYLVANIA - RTK: The following components are listed: 1,2-ETHANEDIAMINE, N-(2-AMINOETHYL)-; 4,4'-ISOPROPYLIDENEDIPHENOL; ETHANOL, 2-AMINO-

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

Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic). D-2B
Class E: Corrosive material

CEPA DSL : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

15 . Regulatory information

- International lists** :
- Australia inventory (AICS):** All components are listed or exempted.
 - China inventory (IECSC):** All components are listed or exempted.
 - Japan inventory:** All components are listed or exempted.
 - Korea inventory:** All components are listed or exempted.
 - New Zealand Inventory of Chemicals (NZIoC):** Not determined.
 - Philippines inventory (PICCS):** All components are listed or exempted.

16 . Other information

- Label requirements** :
- CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN.
 - CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED.
 - CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

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

Health	3
Flammability	1
Physical hazards	1
Personal protection	

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

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



- Date of printing** : 6/18/2011.
Date of issue : 6/18/2011.
Date of previous issue : 6/8/2011.
Version : 2
- ✔ Indicates information that has changed from previously issued version.

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



16 . Other information

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

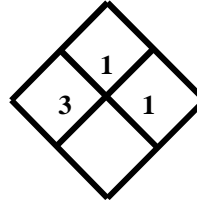
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The Woodlands, TX 77387-4980

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International Emergency Phone: (409) 727-0831
Asia Pacific Emergency Phone: (65) 6336-6011

Effective Date: 5/31/07**Material Safety Data Sheet**

MSDS No: 2525

1. PRODUCT IDENTIFICATION**Trade Name:** EPOCAST HARDENER 9816**Material Code:** FPC5011**Chemical Family:** Modified Aliphatic Amines**NFPA 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				
*	112-24-3	1,2-Ethanediamine, N,N'-bis(2-aminoethyl)- Triethylenetetramine Common Name: Concentration 5.00 - 10.00 % by wt	NE	NE	NE	NE	NE	NR	NR	NR
*	Confidential Concentration	Alkyl Diamine 60.00 - 100.00 % by wt	NE	NE	NE	NE	NE	NR	NR	NR

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

3. HAZARDS IDENTIFICATION

Emergency Overview: Warning!! Causes severe eye irritation and possible eye damage. Causes severe skin irritation and possible allergic skin reaction. Harmful if inhaled. Harmful if swallowed.

Primary Route(s) of Entry: Dermal, inhalation.

Potential Health Effects: Vapor or mists can irritate the nose and throat. Severely irritating to eyes with possible permanent injury. Severely irritating and harmful if absorbed through skin. Substance will cause burning and severe swelling of the mouth, throat and abdomen.

Carcinogenicity (NTP, IARC, OSHA): The chemicals listed in Section 2 are not considered to be carcinogenic by NTP, IARC, or OSHA.

Chronic: Prolonged or repeated exposure can cause damage to liver or kidney. Substance can cause allergic reaction.

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4. FIRST AID MEASURES

Ingestion: If swallowed dilute by giving two (2) glasses water to drink. See a physician. Never give anything by mouth to an unconscious person.

Skin: For skin contact, wash affected areas with plenty of water, and soap, if available, for several minutes. Get medical attention if irritation occurs.

Inhalation: If inhaled, remove from area to fresh air. If not breathing, give artificial respiration. Get immediate medical attention. If breathing is difficult, transport to medical care and, if available, give supplemental oxygen.

Eyes: For eye contact, immediately flush eyes for at least 15 minutes with running water. Hold eyelids apart to ensure rinsing of the entire eye surface and lids with water. Get immediate medical attention.

Note to Physician: Allergic dermatitis or respiratory response in susceptible individuals may be delayed. It may appear after weeks or even months of frequent and prolonged contact.

Medical Conditions Aggravated by Exposure: Allergy, skin, eye and respiratory disease/condition.

5. FIRE FIGHTING MEASURES

Flash Point: > 95°C (> 203 °F)

Flash Point Method Used: Closed Cup

Fire Fighting Extinguishing Media: Carbon dioxide, foam, dry chemical, water spray.

Fire Fighting Equipment: Use self-contained breathing apparatus and full protective clothing.

Fire and Explosion Hazards: Keep fire-exposed containers cool with water.

Hazardous Combustion Products: Decomposition and combustion products may be toxic.

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Evacuate the spill area. Wear full protective equipment. Dike and absorb spill with inert material (sand, earth, etc.). Transfer to containers suitable for disposal. Remove contaminated clothing promptly and wash affected skin areas with soap and water. Thoroughly launder clothing before reuse. Keep spills and runoffs out of municipal sewers and open bodies of water. If spilled on a porous surface, ground contamination must be considered.

7. HANDLING AND STORAGE

Signal Word: Warning !

Precautions: Do not get in eyes, on skin, or on clothing. Wear chemical splash goggles and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Use only with adequate ventilation. Keep containers closed when not in use. Do not take internally.

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Other Handling Information: In accordance with good industrial practice, handle with care and avoid unnecessary personal contact. Avoid contact with eyes and prolonged or repeated skin contact. Do not inhale mists. Use with adequate ventilation. For industrial use only.

Storage Information: STORAGE TEMPERATURE: 35 deg C, maximum. Store indoors in a cool, dry area with adequate ventilation.

Additional Information: PLEASE READ TECHNICAL DATA SHEET BEFORE HANDLING THE PRODUCT. KEEP OUT OF THE REACH OF CHILDREN. FOR INDUSTRIAL USE ONLY.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protective Equipment: Eye bath and safety shower should be available. Wear protective clothing.

Exposure Guidelines: Wash thoroughly after handling and before eating, drinking, or using tobacco products.

Skin Protection: Wear impervious gloves.

Respiratory Protection: Wear respirator (MSHA/NIOSH or approved equivalent) suitable for concentrations and type of air contaminants encountered.

Eye Protection: Wear splash-proof chemical goggles.

Engineering Controls: Good general mechanical ventilation and local exhaust recommended.

Emergency Response Protection: Wear breathing apparatus (MSHA/NIOSH-approved, pressure demand, self-contained or equivalent) and full protective gear.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Low Viscosity Liquid
Color:	Light Amber
Odor:	Mild ammoniacal
Solubility in Water:	Appreciable
Viscosity:	250 cps
Vapor Pressure:	< 1 mm Hg at 20°C (68 °F)
Specific Gravity:	1.02 (Water = 1)
Evaporation Rate:	< 1 (Butyl Acetate = 1)
Vapor Density:	> 1 (Air = 1)
VOC:	12 g/L (This is an estimated value.)
Coefficient of water/oil:	Not Evaluated

10. STABILITY AND REACTIVITY

Conditions to Avoid: Elevated temperatures and epoxy resins in bulk

Stability: Stable under normal conditions.

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Incompatibility: Oxidizing agents, aldehydes, ketones, and mineral acids.**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, aldehydes, and oxides of nitrogen**Hazardous Polymerization:** Will not occur.**11. TOXICOLOGICAL INFORMATION****Acute Oral Effects (LD50):** Not available.**Acute Dermal Toxicity (LD50):** Not available.**Inhalation Toxicity (LC50):** Not available**Sensitization:** Moderate sensitizer.**Skin Irritation:** Severe skin irritant.**Eye Irritation:** Severe eye irritant.**Teratogenicity:** A component in this material can cause fetal toxicity although the effect is believed to be according to the chelating activity of this component.**12. ECOLOGICAL INFORMATION****Biodegradability:** No information available.**Ecotoxicity:** No information available.**13. DISPOSAL CONSIDERATIONS****Waste Disposal Method:** Incinerate liquid; landfill or incinerate contaminated diking material in accordance with local, state, and federal regulations.**14. TRANSPORT INFORMATION****DOT: Non-Bulk****Proper Shipping Name:** Not Regulated**TDG:****Proper Shipping Name:** Not Regulated**IATA: Non-Bulk****Proper Shipping Name:** Not Regulated**IMDG: Non-Bulk****Proper Shipping Name:** Not Regulated**Department of Transportation:** Skin corrosivity test results were negative.

Effective Date: 5/31/07

15. REGULATORY INFORMATION**US Federal Regulations:**

Occupational Safety and Health Act (OSHA): This Material Safety Data Sheet (MSDS) has been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.

Resource Conservation and Recovery Act (RCRA): Not a hazardous waste under RCRA (40 CFR 261).

SARA Title III: Section 304 - CERCLA: This product contains no chemicals regulated under Section 304 as extremely hazardous chemicals for emergency release notification ("CERCLA" List).

SARA Title III: Section 311/312 - Hazard Communication Standard (HCS): Immediate (acute) health hazard

SARA Title III: Section 313 Toxic Chemical List (TCL): This product does not contain a toxic chemical for routine annual 'Toxic Chemical Release Reporting' under Sec. 313 (40 CFR 372).

TSCA Section 8(b) - Inventory Status: Chemical components listed on TSCA Inventory.

TSCA Section 12(b) - Export Notification: This product does not contain any chemicals subject to Section 12(b) export notification.

International Regulations:

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

Canadian Inventory Status: This product contains chemicals which are currently listed on the Canadian Domestic Substance List (DSL) or Non Domestic Substance List (NDSL).

Canadian WHMIS: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. D2B

European Inventory Status (EINECS): This product contains only chemicals that are currently listed on the European Inventory of Existing Commercial Chemical Substances (EINECS).

Japanese Inventory Status: This product contains one or more chemicals currently not on the Japanese Ministry of International Trade and Industry List of Existing and New Chemical Substances.

State Regulations:

California Proposition 65: This product does not contain any chemicals currently on the California list of Known Carcinogens and Reproductive Toxins.

Pennsylvania Right-to-Know: The following is required composition information:

Chemical Name: Alkyl Diamine

CAS Number: Confidential

Comment: Not on Pennsylvania Hazardous Substance List

Effective Date: 5/31/07

Chemical Name: 1,2-Ethanediamine, N,N'-bis(2-aminoethyl)-
Common Name: Triethylenetetramine
CAS Number: 112-24-3
Comment: Hazardous Substance

16. OTHER INFORMATION

MSDS No: 2525
Reason Issued: add WHMIS & syn 5/07 - add syn 10/06
- Update transport & synonyms
Prepared By: Matthew Austin
Approved By: Matthew Austin
Title: EH & S Chemist
Supersedes Date: 10/19/06

Other Information: L/M Codes: JH/KL - JL0597(J10022630) [J05]
Material Code: FPC5011

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