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**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Chemical family Polyamines and modified polyamines

General information: The following data pertain to the hardener only; properly mixed and cured epoxies are not hazardous.

**Producer**

InduMar Products, Inc.  
P. O. Box 770008  
Houston, TX. 77215-0008

**EMERGENCY INFORMATION**

Emergency telephone number  
(800) 523-7867  
Other calls: (713) 977-4100

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

HAZARDOUS CONSTITUENTS	Constituent	Abbr.	CAS No.	Weight percent	Exposure limits		
					ACGIH TLV	OSHA PEL	Other Limits
	Diethylenetriamine	DETA	111400	< 50	1 ppm	1 ppm	1 ppm (Canada)
	Triethylenetetramine	TETA	112243	20-40	n/e	n/e	1 ppm (AIHA-WE) (EL)
	Bisphenol A		80057	< 70	n/e	n/e	5 (DFG-MA) (K)

"TLV" means the Threshold Limit Value exposure (eight-hour, time-weighted average, unless otherwise noted) as established by the American Conference of Governmental Industrial Hygienists. "STEL" indicates a short-term exposure limit. "PEL" indicates the OSHA Permissible Exposure Limit. "n/e" indicates that no exposure limit has been established. An asterisk (\*) indicates a substance whose identity is a trade secret of our supplier and unknown to us.

**3. HAZARDS IDENTIFICATION****Emergency Overview**

Appearance, physical form, odor: Black liquid with mild ammonia-like odor.

**DANGER! Corrosive. Causes eye and skin burns. Severe eye, skin and respiratory tract irritant (evidenced by rash, burning sensation, sore throat, nausea, shortness of breath). Harmful if absorbed through skin. May cause skin sensitization. Avoid breathing vapors. Use with adequate ventilation. Do not take internally. Wash thoroughly after handling.**

**Potential health effects:****Primary routes of exposure:**

Skin contact     Skin absorption     Eye contact     Inhalation     Ingestion

**Symptoms of acute overexposure:****Skin:**

Corrosive. Severe irritant. Can cause pain, burns, necrosis and permanent injury. Toxic by skin absorption (malaise, discomfort, injury and death unless treated promptly). May cause skin sensitization.

**Eyes:**

Corrosive. Severe irritant. Can cause pain, burns, necrosis and permanent injury (blindness). Vapors can cause lacrimation, conjunctivitis and corneal edema when absorbed into the tissue of the eye.

**Inhalation:**

Inhalation of vapors can cause irritation in the respiratory tract. Inhalation of mists and aerosols may severely damage contacted tissue and produce scarring.

**Ingestion:**

May cause irritation of mouth and throat and gastrointestinal tract.

**Effects of chronic overexposure:**

Repeated skin contact can cause sensitization, with itching, rashes, or swelling of the skin. May cause respiratory sensitization/asthmatic response. Repeated and /or prolonged exposures may result in: adverse skin effects (such as defatting, rash, irritation or corrosion), adverse eye effects (such as conjunctivitis or corneal damage), and adverse

**Medical conditions which may be aggravated by exposure:**

Asthma. Chronic respiratory disease (e.g. Bronchitis, Emphysema). Eye disease. Skin disorders and allergies.

**Carcinogenicity -- OSHA regulated:** No    **ACGIH:** No    **National Toxicology Program:** No  
**International Agency for Research on Cancer:** No  
**Cancer-suspect constituent(s):** None

**Other effects:**

Repeated and/or prolonged exposure to low concentrations of vapor may cause: sore throat, eye irritation, nausea, faintness, headache, which are transient. Exposure to vapor may also cause minor transient edema of the corneal epithelium (blue-haze). This effect produces a blurring of vision against a general bluish haze and the appearance of halos around bright objects. The effect disappears spontaneously within a few hours of the end of exposure and leaves no sequelae.

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**4. FIRST AID MEASURES****First aid for eyes:**

Immediately flush with clean water for at least 15 minutes while gently holding eyelids open. Get medical help as soon as possible.

**First aid for skin:**

Immediately remove contaminated clothing and shoes. Flush affected area with water. Wash with soap and water. Seek medical advice.

**First aid for inhalation:**

Remove patient to fresh air. Give oxygen or artificial respiration if needed. Prevent aspiration of vomit. Turn victims head to side. Seek medical advice.

**First aid for ingestion:**

Do NOT induce vomiting. Dilute with lots of milk or water (3-4 glasses). Never give anything by mouth to an unconscious person. Get immediate medical help.

## 5. FIRE FIGHTING MEASURES

**Extinguishing media:** Water Carbon dioxide Dry chemical Foam Alcohol foam**Flash Point (°F):** >200**Method:** estimate**Explosive limits in air -- Lower:** n/d**Upper:** n/d**Special firefighting procedures:**

Firefighters should wear self-contained breathing apparatus and sufficient protective gear (butyl rubber) to prevent all skin and eye contact with this material. Retain liquids from fire fighting for later disposal.

**Unusual fire and explosion hazards:**

Sudden reaction and fire may result if product is mixed with an oxidizing agent. Personnel in vicinity and downwind should be evacuated.

**Hazardous products of combustion:**

Acrid and toxic fumes with organic amines, ammonia, oxides of carbon and nitrogen.

## 6. ACCIDENTAL RELEASE MEASURES

**Spill control:**

Avoid personal contact. Eliminate ignition sources. Ventilate area. Reduce vapor spreading with a water spray. Clean-up personnel should wear proper protective clothing and respirator.

**Containment:**

Dike, contain and absorb with clay, sand or other suitable (non-reactive) material.

**Cleanup:**

For large spills, pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand, or other suitable material and dispose of properly. Flush area with water to remove trace residue.

**Special procedures:**

Prevent spill from entering drainage/sewer systems, waterways, and surface waters.

## 7. HANDLING AND STORAGE

**Handling precautions:**

Avoid contact with skin, eyes, or clothing. Handle in well ventilated work space. Wash thoroughly with soap and water after using and particularly before eating, drinking, smoking, applying cosmetics, or using toilet facilities.

Launder contaminated clothing and protective gear before reuse. Discard contaminated leather articles. Handle mixed resin and hardener in accordance with the potential hazard of the curing agent used. Provide appropriate ventilation/respiratory protection against decomposition products (see Section 10) during welding/flame cutting operations and to protect against nuisance dust during sanding/grinding of cured product. Do not use sodium nitrite or other nitrosating agents in formulations containing this product, cancer-causing nitrosamines could be formed.

**Storage precautions:**

Keep away from acids and oxidizers. Store in a cool, dry, ventilated area in closed containers. Keep away from high temperatures and flames. Do not store in iron or other reactive metal containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Engineering controls****Ventilation:**

General mechanical ventilation is adequate for occasional use. For prolonged or repeated use, local exhaust is recommended.

**Other engineering controls:**

Have emergency shower and eye wash stations available.

**Personal protective equipment****Eye and face protection:**

Splash-proof eye goggles. In emergency situations, use eye goggles with full face shield.

**Skin Protection:**

Chemical-resistant rubber (for example, neoprene, butyl rubber or nitrile) gloves and other protective gear as needed to prevent skin contact.

**Respiratory protection:**

None needed in normal use with proper ventilation. In poorly ventilated areas or when creating a dust or mist, use NIOSH-approved ammonia vapor respirator as exposure levels dictate.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Specific gravity:</b>	1.06	<b>Boiling point (°F):</b>	>450
<b>Melting point (°F):</b>	n/d	<b>Vapor density (air = 1):</b>	>1
<b>Vapor pressure (mmHg):</b>	<0.05	at 68 °F	<b>Evaporation rate (butyl acetate = 1):</b> <<1
<b>VOC (grams/liter):</b>	< 25	<b>Solubility in water:</b>	Completely
<b>Percent volatile by volume:</b>	0	<b>pH (5% solution or slurry in water):</b>	11.1
<b>Percent solids by weight:</b>	100		0

**10. STABILITY AND REACTIVITY**

This product is chemically stable.

Hazardous polymerization will not occur.

**Conditions to avoid:**

Extreme heat or open flame. Product slowly corrodes copper, aluminum, zinc and galvanized surfaces.

**Incompatible materials:**

Oxidizers, acids, reactive metals. Sodium or calcium hypochlorite. Nitrous acid, nitrites, nitrous oxide atm. Peroxides. Mat'ls reactive with hydroxyl compounds.

**Hazardous decomposition products:**

Acrid and toxic fumes including organic amines, ammonia, oxides of nitrogen and carbon, nitric acid, nitrosamines. Aldehydes.

**Conditions of hazardous polymerization:**

Heat is generated when this hardener reacts with acids and epoxy resins. Mix only as instructed.

**11. TOXICOLOGICAL INFORMATION****Acute oral effects:**

LD50 (rat): > 1000 mg/kg (estimate)

**Acute dermal effects**

LD50 (rabbit): No data

TETA has been found to be toxic by skin absorption (ANSI Z129.1 1988). TETA is a severe irritant to the skin of a rabbit.

**Acute inhalation effects:**

LC50 (rat): No data in 0 hours

**Eye irritation:**

TETA is a severe irritant to the eyes of a rabbit.

**Subchronic effects**

No data.

**Chronic effects**

It has been generally observed in animal studies that aliphatic amines can cause changes in the lungs and heart. TETA has been found to produce liver and kidney damage and brain congestion in dermally exposed animals. Sensitization has occurred in laboratory animals after repeated exposures.

**Carcinogenicity, teratogenicity, and mutagenicity:**

TETA has tested positive in screening tests for mutagenicity. TETA was found fetotoxic and teratogenic when fed to rats at 0.83% and 1.67% of diet. When applied dermally to the skin of pregnant guinea pigs, there was a 90% abortion rate or death of fetus with developmental anomalies. In an oral gavage screening study, DETA has been toxic to the fetus in laboratory animal tests.

**Toxicological information on hazardous chemical constituents of this product:**

Constituent	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 (rat, 4 hours)
Diethylenetriamine	1080 mg/kg	1090 mg/kg	n/d
Triethylenetetramine	2500 mg/kg	805 mg/kg	n/d
Bisphenol A	3250 mg/kg	3 mL/kg	n/d

**12. ECOLOGICAL INFORMATION****Ecotoxicity:**

DETA: Acute LC50 for water flea (*Daphnia magna*) is 17 mg/l; DETA: Acute LC50 for fathead minnow (*Pimephales promelas*) is 332 mg/L. DETA: Acute LC50 for brine shrimp (*Artemia salina*) is 710 mg/L.

**Mobility and persistence:**

No data.

**Environmental fate:**

No data.

**13. DISPOSAL CONSIDERATIONS****Waste management recommendations:**

If this material becomes a waste, it would not be a hazardous waste by RCRA criteria (40CFR 261). Dispose of according to applicable federal, state, and local regulations.

**14. TRANSPORT INFORMATION****Proper shipping name:** Corrosive liquid, basic, organic, n.o.s.**Technical name:** Triethylenetetramine & Diethylenetriamine**Hazard class:** 8**UN number:** 3267      **Packing group:** II      **IMDG Page no.:** N/A**Emergency Response Guide no.:** 153**Other:** N/A**15. REGULATORY INFORMATION****U.S. Federal Regulations****TSCA:**

All ingredients of this product are listed, or are exempt from listing, on the TSCA Inventory.

**The following RCRA code(s) applies to this material if it becomes waste:** None**Regulatory status of hazardous chemical constituents of this product:**

Constituent	Extremely Hazardous*	Toxic Chemical**	CERCLA RQ (lbs)	TSCA 12B Export Notification
Diethylenetriamine	No	No	No	Required
Triethylenetetramine	No	No	No	Not required
Bisphenol A	No	Yes	No	Required

\*Consult the appropriate regulations for emergency planning and release reporting requirements for substances on the SARA Section 301 Extremely Hazardous Substances list.

\*\*Substances for which the "Toxic Chemical" column is marked "Yes" are on the SARA Section 313 list of Toxic Chemicals, for which release reporting may be required. Consult the appropriate regulations for specific requirements.

**Classification of this material for SARA Section 312 hazardous materials inventory reporting:**

Immediate health hazard    Delayed health hazard

**Canadian regulations****WHMIS hazard class(es):** D2B; D1B; E

All components of this product are on the Domestic Substances List.

**16. OTHER INFORMATION**

<b>Hazardous Materials Information System (HMIS) ratings:</b>		
<b>Health</b>	<b>Flammability</b>	<b>Reactivity</b>
<b>3*</b>	<b>1</b>	<b>1</b>

The information and recommendations in this document are based on the best information available to us at the time of preparation, but we make no other warranty, express or implied, as to its correctness or completeness, or as to the results of reliance on this document.

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**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Chemical family Epoxy resin

General information: This information applies to the resin component of the two-part kit; handle freshly-mixed resin and hardener as recommended for the hardener. After curing, the product is not hazardous.

**Producer**

InduMar Products, Inc.  
P. O. Box 770008  
Houston, TX. 77215-0008

**EMERGENCY INFORMATION**

Emergency telephone number  
**(800) 523-7867**  
Other calls: **(713) 977-4100**

**2. COMPOSITION/INFORMATION ON INGREDIENTS****HAZARDOUS CONSTITUENTS****Exposure limits**

Constituent	Abbr.	CAS No.	Weight percent	ACGIH TLV	OSHA PEL	Other Limits
Bisphenol A diglycidyl ether resin	DGEB PA	25068386	> 80	n/e	n/e	n/e

"TLV" means the Threshold Limit Value exposure (eight-hour, time-weighted average, unless otherwise noted) as established by the American Conference of Governmental Industrial Hygienists. "STEL" indicates a short-term exposure limit. "PEL" indicates the OSHA Permissible Exposure Limit. "n/e" indicates that no exposure limit has been established. An asterisk (\*) indicates a substance whose identity is a trade secret of our supplier and unknown to us.

**3. HAZARDS IDENTIFICATION****Emergency Overview**

Appearance, physical form, odor: White viscous liquid with little odor.

**WARNING! Eye and skin irritant. Potential skin sensitizer.**

**Potential health effects:****Primary routes of exposure:**

Skin contact     Skin absorption     Eye contact     Inhalation     Ingestion

**Symptoms of acute overexposure:****Skin:**

Moderate irritant. Contact at elevated temperatures can cause thermal burns. May cause skin sensitization (rashes, hives).

**Eyes:**

Moderate irritant. Contact at elevated temperatures can cause thermal burns.

**Inhalation:**

The low vapor pressure of the resin makes inhalation unlikely in normal use.

**Ingestion:**

Acute oral toxicity is low. May cause gastric distress.

**Effects of chronic overexposure:**

Prolonged or repeated skin contact may cause sensitization, with itching, swelling, or rashes on later exposure.

**Medical conditions which may be aggravated by exposure:**

Preexisting eye and skin disorders. Development of preexisting skin or lung allergy symptoms may increase.

**Carcinogenicity -- OSHA regulated:** No      **ACGIH:** No      **National Toxicology Program:** No  
**International Agency for Research on Cancer:** No  
**Cancer-suspect constituent(s):** None

**Other effects:**

See section 11.

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**4. FIRST AID MEASURES****First aid for eyes:**

Flush eye with clean water for at least 15 minutes while gently holding eyelids open. Get immediate medical attention.

**First aid for skin:**

Immediately remove contaminated clothing and excess contaminant. Flush skin with water. Wash thoroughly with soap and warm water. Consult a physician if irritation develops.

**First aid for inhalation:**

Remove patient to fresh air. Administer oxygen if breathing is difficult. Get medical attention if symptoms persist.

**First aid for ingestion:**

Do NOT induce vomiting. Give two glasses of water to dilute if patient is conscious. Get medical attention.

**Note to physician:**

In general, emesis induction is unnecessary in high viscosity, low volatility products, e.g., neat epoxy resins.

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**5. FIRE FIGHTING MEASURES****Extinguishing media:** Water Carbon dioxide Dry chemical Foam Alcohol foam**Flash Point (°F):** >400**Method:** PMCC**Explosive limits in air -- Lower:** n/d**Upper:** n/d**Special firefighting procedures:**

Material will not burn unless preheated. Do not enter confined space without full bunker gear. Firefighters should wear self-contained breathing apparatus and protective clothing. Cool fire exposed containers with water.

**Unusual fire and explosion hazards:**

Heating above 300 deg F in the presence of air may cause slow oxidative decomposition and above 500 deg F may cause polymerization.

**Hazardous products of combustion:**

When heated to decomposition it emits fumes of Cl-, carbon monoxide, other fumes and vapors varying in composition and toxicity.

**6. ACCIDENTAL RELEASE MEASURES****Spill control:**

Avoid personal contact. Eliminate ignition sources. Ventilate area.

**Cleanup:**

For large spills, pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand, or other suitable material and dispose of properly. Flush area with water to remove trace residue.

**Containment:**

Dike, contain and absorb with clay, sand or other suitable material.

**Special procedures:**

Prevent spill from entering drainage/sewer systems, waterways, and surface waters.

**7. HANDLING AND STORAGE****Handling precautions:**

Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after using and particularly before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Launder contaminated clothing and protective gear before reuse. Discard contaminated leather articles. Handle mixed resin and hardener in accordance with the potential hazard of the curing agent used. Provide appropriate ventilation/respiratory protection against decomposition products (see Section 10) during welding/flame cutting operations and to protect against nuisance dust during sanding/grinding of cured product.

**Storage precautions:**

Store in a cool, dry area away from high temperatures and flames.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Engineering controls****Ventilation:**

Local exhaust ventilation is preferred although good general mechanical ventilation is usually adequate for most industrial applications. Local exhaust is recommended for confined areas.

**Other engineering controls:**

Have emergency shower and eye wash available.

**Personal protective equipment****Eye and face protection:**

Safety glasses with side shields.

**Skin Protection:**

Chemical-resistant gloves and other gear as required to prevent skin contact.

**Respiratory protection:**

None required at normal handling temperatures and conditions. Use NIOSH approved organic vapor cartridges for uncured resin and dust/particle respirators during grinding/sanding operations of cured resin as exposure levels dictate.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Specific gravity:</b>	1.18	<b>Boiling point (°F):</b>	>500
<b>Melting point (°F):</b>	n/d	<b>Vapor density (air = 1):</b>	>1
<b>Vapor pressure (mmHg):</b>	0.03 mm Hg at 171 °F	<b>Evaporation rate (butyl acetate = 1):</b>	<<1
<b>VOC (grams/liter):</b>	0	<b>Solubility in water:</b>	Negligible
<b>Percent volatile by volume:</b>	0	<b>pH (5% solution or slurry in water):</b>	neutral
<b>Percent solids by weight:</b>	100		0

**10. STABILITY AND REACTIVITY**

This product is chemically stable. Hazardous polymerization will not occur.

**Conditions to avoid:**

Open flame and extreme heat

**Incompatible materials:**

Strong Lewis or mineral acids, strong oxidizing agents, strong mineral and organic bases (especially primary and secondary aliphatic amines).

**Hazardous decomposition products:**

Oxides of carbon; aldehydes, acids and other organic substances may be formed during combustion or elevated temperature (>500 deg F) degradation.

**Conditions of hazardous polymerization:**

Heat is generated when resin is mixed with curing agents; Run-a-way cure reactions may char and decompose the resin, generating unidentified fumes and vapors which may be toxic.

**11. TOXICOLOGICAL INFORMATION****Acute oral effects:**

LD50 (rat): n/d

**Acute dermal effects**

LD50 (rabbit): n/d

DGEBPA: Draize -1.6 (rabbit)

**Acute inhalation effects:**

LC50 (rat): n/d in 8 hours

**Eye irritation:**

DGEBPA: Draize - 2.0 (rabbit)

**Subchronic effects**

No data available.

**Chronic effects**

Prolonged or repeated skin contact may cause sensitization, with itching, swelling, or rashes on later exposure. Studies have shown bisphenol A diglycidyl ether resin to cause allergic contact dermatitis.

**Carcinogenicity, teratogenicity, and mutagenicity:**

1) MUTAGENICITY: Liquid resins based on diglycidyl ether of Bisphenol A (DGEBPA), have proved to be inactive when tested by in vivo mutagenicity assays. These resins have shown activity in in vitro microbial mutagenicity screening and have produced chromosomal aberrations in cultured rat liver cells. The significance of these tests to man is unknown. 2) CARCINOGENICITY: Recent 2-year bioassays in rats and mice exposed by the dermal route to DGEBPA yielded no evidence of carcinogenicity to the skin or any other organs. This study clarifies prior equivocal results from a 2-year mouse skin painting study, which were suggestive, but not conclusive, for weak carcinogenic activity. 3) The International Agency for Research on Cancer (IARC) concluded that DGEBPA is not classifiable as a carcinogen (IARC group 3), that is human and animal evidence of carcinogenicity is inadequate.

**Toxicological information on hazardous chemical constituents of this product:**

Constituent	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 (rat, 4 hours)
Bisphenol A diglycidyl ether resin	11.4 g/kg	>20 ml/kg	no deaths

**12. ECOLOGICAL INFORMATION****Ecotoxicity:**

No data available.

**Mobility and persistence:**

No data available.

**Environmental fate:**

No data available.

**13. DISPOSAL CONSIDERATIONS****Waste management recommendations:**

If this resin becomes a waste, it would not be a hazardous waste by RCRA criteria (40CFR 261). Dispose of according to applicable federal, state, and local regulations.

**14. TRANSPORT INFORMATION****Proper shipping name:** Non-regulated**Technical name:** N/A**Hazard class:** N/A**UN number:** N/A**Packing group:** N/A**IMDG Page no.:** N/A**Emergency Response Guide no.:** N/A**Other:****15. REGULATORY INFORMATION****U.S. Federal Regulations****TSCA:**

All ingredients of this product are listed, or are exempt from listing, on the TSCA Inventory.

**The following RCRA code(s) applies to this material if it becomes waste:** None

**Regulatory status of hazardous chemical constituents of this product:**

Constituent	Extremely Hazardous*	Toxic Chemical**	CERCLA RQ (lbs)	TSCA 12B Export Notification
Bisphenol A diglycidyl ether resin	No	No	No	Not required

\*Consult the appropriate regulations for emergency planning and release reporting requirements for substances on the SARA Section 301 Extremely Hazardous Substances list.

\*\*Substances for which the "Toxic Chemical" column is marked "Yes" are on the SARA Section 313 list of

Toxic Chemicals, for which release reporting may be required. Consult the appropriate regulations for specific requirements.

**Classification of this material for SARA Section 312 hazardous materials inventory reporting:**

Immediate health hazard    Delayed health hazard

**Canadian regulations**

**WHMIS hazard class(es):**    D2B

All components of this product are on the Domestic Substances List.

**16. OTHER INFORMATION**

Hazardous Materials Information System (HMIS) ratings:		
Health	Flammability	Reactivity
2*	1	1

**Revisions for this issue:****MSDS Section****Revisions**

11            Updated toxicology data

The information and recommendations in this document are based on the best information available to us at the time of preparation, but we make no other warranty, express or implied, as to its correctness or completeness, or as to the results of reliance on this document.