



广州孚润 400-992-6811

ECCOBOND[®] 286 A/B

Easy Mix Ratio, General Purpose Epoxy Adhesive

Key Feature:	Benefit:
• Convenient mix ratio	• Ease of use
• Room temperature cure	• Simplified manufacturing process
• Good thermal conductivity	• Dissipation of heat from bonded components

Product Description:

ECCOBOND 286 A/B is a two component, thermally conductive, room temperature curing, epoxy adhesive. The proper amount of thixotropy is built in to assure minimum flow without sacrificing wetting. ECCOBOND 286 A/B offers good adhesion to a variety of substrates including most metals and plastics.

Applications:

ECCOBOND 286 A/B is recommended for a wide variety of maintenance and production applications. It is ideal for use in piping applications involving metal and/or plastic pipe.

Instructions For Use:

Thoroughly read the information concerning health and safety contained in this bulletin before using. Observe all precautionary statements that appear on the product label and/or contained in individual Material Safety Data Sheets (MSDS).

Properties of Material As Supplied:

Property	Test Method	Unit	Value - Part A	Value - Part B
Chemical Type			Epoxy	Amine
Appearance	Visual		White paste	White paste
Density	ASTM-D-792	g/cm ³	1.21	2.00

Properties of Material As Mixed:

Property	Test Method	Unit	Value
Mix Ratio - Amount of Part B per 100 parts of Part A		By Weight	180
		By Volume	100
Working Life (100 g @ 25°C)	ERF 13-70	minutes	30
Density	ASTM-D-792	g/cm ³	1.71

To ensure the long term performance of the bonded assembly, complete cleaning of the substrates should be performed to remove contamination such as oxide layers, dust, moisture, salt, and oils which can cause poor adhesion or corrosion in a bonded part. For information on proper substrate preparation, refer to the reprint "Good Adhesive Bonding Starts With Surface Preparation" available from Emerson & Cuming.

Some filler settling is common during shipping and storage. For this reason, it is recommended that the contents of the shipping container be thoroughly mixed prior to use. Power mixing is preferred to ensure a homogeneous product.

Accurately weigh resin and hardener into a clean container in the recommended ratio. Weighing apparatus having an accuracy in proportion to the amounts being weighed should be used.

Blend components by hand, using a kneading motion, for 2-3 minutes. Scrape the bottom and sides of the mixing container frequently to produce a uniform mixture. If possible, power mix for an additional 2-3 minutes. Avoid high mixing speeds which could entrap excessive amounts of air or cause overheating of the mixture resulting in reduced working life.

Apply the adhesive to all surfaces to be bonded and join together. In most applications only contact pressure is required.

"Our service engineers are available to help purchasers obtain best results from our products, and recommendations are based on tests and information believed to be reliable. However, we have no control over the conditions under which our products are transported to, stored, handled, or used by purchasers and, in any event, all recommendations and sales are made on condition that we will not be held liable for any damages resulting from their use. No representative of ours has any authority to waive or change this provision. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care[®] program."

Cure Schedule:

Cure at any one of the recommended cure schedules. For optimum performance, follow the initial cure with a post cure of 2 - 4 hours at the highest expected use temperature. Alternate cure schedules may also be possible. Contact your Emerson & Cuming Technical Representative for further information.

Temperature	Cure Time (hours)
°C	Time
25	24
45	4
65	2

Properties of Material After Application:

Property	Test Method	Unit	Value
Flexural Strength	ASTM-D-790	mPa psi	83 12,000
Tensile Lap Shear Strength aluminum to aluminum @ 25°C	ASTM D-1002	mPa psi	15.2 2,200
Coefficient of Thermal Expansion	ASTM-D-3386	10 ⁻⁶ /°C	36
Thermal Conductivity	ASTM-D-2214	W/m.K Btu-in/hr-ft ² -°F	1.04 7.2
Temperature Range of Use		°C	-55 to +105
Volume Resistivity @ 25°C	ASTM-D-257	Ohm-cm	>10 ¹⁵

Storage and Handling:

The shelf life of ECCOBOND 286 Parts A and B are 12 months at 25°C. For best results, store in original, tightly covered containers. Storage in cool, clean and dry areas is recommended. Usable shelf life may vary depending on method of application and storage conditions. Certain resins and hardeners are prone to crystallization. If crystallization does occur, warm the contents of the shipping container to 50-60°C until all crystals have dissolved. Be sure the shipping container is loosely covered during the warming stage to prevent any pressure build-up. Allow contents to cool to room temperature before continuing.

Health and Safety:

The ECCOBOND 286 Part A, like most epoxy compounds, possesses the ability to cause skin and eye irritation upon contact. Certain individuals may also develop an allergic reaction after exposure (skin contact, inhalation of vapors, etc.) which may manifest itself in a number of ways including skin rashes and an itching sensation. Handling this product at elevated temperatures may also generate vapors irritating to the respiratory system.

The ECCOBOND 286 Part B is classified as a corrosive material. Direct contact with unprotected eyes or skin can cause severe burns. Certain individuals may

also develop an allergic skin or respiratory reaction after exposure. These reactions may manifest themselves in a number of ways including skin rashes, itching sensation and breathing difficulties. Handling this product may also generate vapors irritating to the respiratory system.

Good industrial hygiene and safety practices must be used when handling this product. Proper eye protection and appropriate chemical resistant clothing must be worn to prevent contact. Consult the Material Safety Data Sheet (MSDS) for detailed recommendations on the use of engineering controls, personal protective equipment and first aid procedures.

This information is only a brief summary of the available safety and health data. Thoroughly review the MSDS for more complete information before using this product.

Attention Specification Writers:

The values contained herein are considered typical properties only and are not intended to be used as specification limits. For assistance in preparing specifications, please contact Emerson & Cuming Quality Assurance for further details.

Medical Implantable Disclaimer

"In the event this product is intended by you for use in implantation in the human body, you are hereby advised that National Starch (or Emerson & Cuming) has not performed clinical testing of these materials for implantation in the human body nor has National Starch (Emerson & Cuming) sought, nor received, approval from the FDA for the use of these material in implantation in the human body. It is YOUR responsibility, as a manufacturer of any such device, to ensure that all materials and processes relating to the manufacture of any medical device fully comply with all applicable federal, state and local laws, rules, regulations and requirements as well as any such laws, rules, regulations, directives or other orders of any foreign country where such product is sold. If you have not undertaken the necessary investigations to ensure compliance you are advised NOT TO USE this product in the manufacture of any device which is to be implanted in the human body. No representative of ours has any authority to change the foregoing provisions."

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// Underfills // Solder Alternatives // C.O.B Materials
// Encapsulants // Coatings // Adhesives // Film Adhesives // Thermal Interfaces
// Electrically Conductive Coatings and Adhesives

// Europe
Nijverheidsstraat 7
B-2260 Westerlo
Belguim
☎ : +(32)-(0) 14 57 56 11
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// North America
46 Manning Road
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NATIONAL STARCH AND CHEMICAL

MSDS ID: EC180726

MSDS DATE 07-December-2007



广州孚润 400-992-6811

*** MATERIAL SAFETY DATA SHEET ***

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS ID:	EC180726
PRODUCT NAME	ECCOBOND™ 286 WHITE, PART A Epoxy Adhesive
- MANUFACTURER -	Emerson & Cuming A National Starch & Chemical Company 46 Manning Road Billerica, MA 01821
	EMERGENCY CONTACT NUMBERS: MEDICAL: 866-359-5657 (Health & Safety Call Center-24 hours) TRANSPORT: CHEMTREC: 800.424.9300 (24 hours) CHEMTREC International: 703.527.3887 (call collect) Corporate Emergency Phone: 978.436.9781 (8AM-5PM, Mon-Fri EST) MSDS Requests/Cust. Service: 781.828.3300 (8AM-5PM, Mon-Fri EST)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING.
EYE IRRITANT.
SKIN IRRITANT.
SKIN SENSITIZER.
White Paste Slight odor

EYE CONTACT	Irritating, but does not injure eye tissue.
SKIN CONTACT	Irritating to the skin. Repeated and/or prolonged contact may cause skin sensitization.
INHALATION	Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature. Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.
INGESTION	Ingestion may cause irritation of the gastrointestinal tract.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY	Formulated Epoxy Resin		
COMPONENT	CAS NUMBER	CONCENTRATION	
Epoxy resin	PROPRIETARY	(% by weight)	
		>50	

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4. FIRST-AID MEASURES

EYE	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention.
SKIN CONTACT:	Remove grossly contaminated clothing, including shoes, and launder before re-use. Discard shoes. Wash skin with soap and water. If symptoms develop, obtain medical attention.
INHALATION INGESTION	Remove to fresh air. Administer oxygen to aid breathing. Get medical attention. DO NOT attempt to give anything by mouth to an unconscious person. If individual is conscious, give water to dilute stomach contents. Get prompt medical attention.

5. FIREFIGHTING MEASURES

AUTOIGNITION	Not available
FLASH POINT	> 200 °F
EXTINGUISHING MEDIA	Foam; Water spray or fog, CO2, Dry Chemical; Do not use direct water stream on burning liquid.
SPECIAL FIREFIGHTING PROCEDURES	A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.; Cool exposed equipment with water spray.
FIRE & EXPLOSION HAZARDS	Combustible at high temperatures. Combustion will evolve toxic and irritant vapors. Polymerization may take place at elevated temperatures.
HAZARDOUS COMBUSTION PRODUCTS	Thermal decomposition products are hazardous and/or toxic. Carbon monoxide, carbon dioxide. Aldehydes
LOWER EXPLOSION LIMIT (%)	Not applicable
UPPER EXPLOSION LIMIT (%)	Not applicable

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES	Evacuate immediate area and dike area to contain spill. Extinguish open flames and ignition sources in the immediate area. Wear proper protective clothing, gloves, and splash goggles. Absorb as much of spilled material as possible with rags, sand, vermiculite or other absorbent material. Scrape absorbed material into designated waste containers. Wash area thoroughly with detergent and rinse, taking care to prevent runoff into drains or other waterways. All spilled material, absorbed waste and wash water must be disposed of in accordance with all Federal state and local regulations.
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For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	25 °C
SHELF LIFE, (Days)	365
HANDLING/STORAGE	Keep containers properly sealed when not in use.
SENSITIVITY TO STATIC ELECTRICITY	No
SPECIAL SENSITIVITY	Avoid excessive heat.
SENSITIVITY TO MECHANICAL IMPACT	No
OTHER PRECAUTIONS	This material should not be spilled, dumped, or flushed into sewers or public waterways.

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this product poses a carcinogenic risk under normal conditions of handling and use.

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE
EFFECTS OF CHRONIC EXPOSURE

The toxicological properties of this product have not been fully evaluated. Use of good industrial hygiene practices is required. Avoid direct contact with skin or eyes. Do not ingest or inhale.

TARGET ORGANS
SKIN SENSITIZATION

Skin; Eyes
Sensitizer. May cause allergic reaction.

PRODUCT TOXICOLOGY
PRODUCT INFORMATION

This data sheet is based on a consideration of the properties of the constituents.

COMPONENT
Epoxy resin

NOTES ON ORAL TOXICITY
Oral LD50: Rat > 5000 mg/kg

NOTES ON ORAL TOXICITY
Unlikely to be hazardous if swallowed.

COMPONENT
Epoxy resin

NOTES ON DERMAL TOXICITY
Dermal LD50: Rabbit > 6000 mg/kg

NOTES ON DERMAL TOXICITY
Repeated or prolonged skin contact may result in moderate irritation. Repeated and/or prolonged contact may cause skin sensitization.

COMPONENT
Epoxy resin

NOTES ON INHALATION TOXICITY

NOTES ON INHALATION TOXICITY
Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature.

COMPONENT
Epoxy resin

NOTES ON EYE IRRITATION
May cause eye irritation.

12. ECOLOGICAL INFORMATION

POTENTIAL EFFECT ON ENVIRONMENT

May cause harm to aquatic organisms. Do not allow to enter drains, sewers or watercourses.

MOBILITY

Insoluble

PERSISTENCE AND DEGRADABILITY

Not readily biodegradable.

POTENTIAL TO BIOACCUMULATE

The product has low potential for bioaccumulation.

AQUATIC TOXICITY

Not available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS

Disposal should be in accordance with local, state or national legislation.

EMPTY CONTAINER WARNINGS

Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

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MSDS ID: EC180726

MSDS DATE 07-December-2007

This section provided for general information only. The shipping description below may not represent requirements for all modes of transportation, packaging, shipping methods or locations outside of the United States.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

T.D.G. CLASS Not Regulated
ICAO/IATA CLASSIFICATION Not classified as dangerous.

15. REGULATORY INFORMATION

WHMIS CLASS	D2B
Canadian Domestic Substance List (DSL)	Is on DSL
TSCA	All components are on the TSCA inventory.
China (IECSC)	On the IECSC Inventory.
Australia (AICS)	On the AICS Inventory.
Korea (KECI)	On the KECI Inventory.
Philippines (PICCS)	On the PICCS Inventory.

16. OTHER INFORMATION

HMIS® Hazard Ratings

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs by OSHA's 29 CFR 1910.1200, we choose to provide them as a service to our customers using HMIS®. These ratings are to be used only with a fully implemented HMIS® program. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

NPCA recommends that employers must determine appropriate PPE for the actual conditions under which this product is used in their workplace. For information on PPE codes, consult the HMIS® Implementation Manual.

When two ratings are provided for Health, the first represents the material 'as supplied', and the second represents the material 'in use'.

* = chronic health hazard

HMIS® is a registered trademark of the National Paint and Coatings Association (NPCA).

<u>Health</u>	<u>Flammability</u>	<u>Reactivity</u>
2	1	0

MSDS DATE	07-December-2007
PREPARED BY	Emerson & Cuming Product Safety:
	Tel: 978.436.9781
	Fax: 978.436.9707

ADDITIONAL INFORMATION: The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.

NATIONAL STARCH AND CHEMICAL

MSDS ID: EC180729

MSDS DATE 11-January-2008



***** MATERIAL SAFETY DATA SHEET *****

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS ID:	EC180729
PRODUCT NAME	ECCOBOND™ 286 WHITE, PART B Epoxy Adhesive (Hardener)
- MANUFACTURER -	Emerson & Cuming A National Starch & Chemical Company 46 Manning Road Billerica, MA 01821
	EMERGENCY CONTACT NUMBERS: MEDICAL: 866-359-5657 (Health & Safety Call Center-24 hours) TRANSPORT: CHEMTREC: 800.424.9300 (24 hours) CHEMTREC International: 703.527.3887 (call collect) Corporate Emergency Phone: 978.436.9781 (8AM-5PM, Mon-Fri EST) MSDS Requests/Cust. Service: 781.828.3300 (8AM-5PM, Mon-Fri EST)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

	DANGER! Possible cancer hazard. CORROSIVE. CAUSES SEVERE OR PERMANENT DAMAGE TO EYES. SEVERE SKIN IRRITANT. MAY CAUSE PERMANENT DAMAGE. HARMFUL IF INHALED. EYE IRRITANT. HARMFUL IF SWALLOWED. RESPIRATORY SENSITIZER. SKIN SENSITIZER. White Paste Amine odor
EYE CONTACT	Extremely severe irritant/corrosive. May cause severe burns which could lead to permanent damage or total loss of vision. The vapor and the liquid may cause burning, intense irritation and excessive watering of the eye.
SKIN CONTACT	Severely irritating; may cause permanent skin damage. Can be rapidly absorbed through skin. Repeated and/or prolonged contact may cause skin sensitization.
INHALATION	Vapor or aerosol, if generated, can cause irritation of the eyes, nose and respiratory tract. Possible respiratory sensitizer. Avoid breathing vapors or mists.
INGESTION	Exposure to high concentrations may produce lung damage. Severe irritation to mouth, throat, and stomach.

NATIONAL STARCH AND CHEMICAL

MSDS ID: EC180729

MSDS DATE 11-January-2008

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY	Formulated Epoxy Resin		
COMPONENT	CAS NUMBER	CONCENTRATION (% by weight)	
3,3'-Oxybis(ethyleneoxy)bis(propylamine)	4246-51-9	10 - 20	
Epoxy resin	PROPRIETARY	5 - 10	
Titanium dioxide	13463-67-7	<0.5	

4. FIRST-AID MEASURES

EYE	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain immediate medical attention.
SKIN CONTACT:	Immediately flush with large amounts of water; use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. Obtain immediate medical attention.
INHALATION	Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention.
INGESTION	If individual is conscious, give water to dilute stomach contents. Get prompt medical attention. DO NOT attempt to give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

AUTOIGNITION	Not available
FLASH POINT	> 200 °F
EXTINGUISHING MEDIA	CO ₂ ; Dry Chemical; Water Spray
SPECIAL FIREFIGHTING PROCEDURES	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.
FIRE & EXPLOSION HAZARDS	A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.
HAZARDOUS COMBUSTION PRODUCTS	Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics.
LOWER EXPLOSION LIMIT (%)	Aldehydes
UPPER EXPLOSION LIMIT (%)	Not applicable
	Not applicable

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES	Spills should be taken up with sand, earth or any suitable absorbent material and placed in containers. Spill area can be washed with water; collect wash water for approved disposal. Do not flush to storm sewer or waterway.
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For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	25 °C
SHELF LIFE, (Days)	365
HANDLING/STORAGE	Store in cool, dry place. Keep in a well ventilated place.
SENSITIVITY TO STATIC ELECTRICITY	No
SPECIAL SENSITIVITY	Keep away from heat.

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SENSITIVITY TO MECHANICAL IMPACT No

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	EXPOSURE LIMITS <u>ACGIH</u>	<u>OSHA</u>	<u>Mfg Working Standard</u>
Titanium dioxide	10 mg/m3 TWA.	15 mg/m3 TWA (total dust)	
VENTILATION	Local exhaust.		
EYE PROTECTION	Wear safety glasses with side shields.		
GLOVES	The use of chemically resistant gloves is recommended.		
CLOTHING	Employee must wear appropriate protective clothing and equipment to prevent any possibility of skin contact with this substance.		
CHANGE/REMOVAL OF CLOTHING	Remove contaminated clothing and launder before reuse.		
WASH REQUIREMENTS	Wash before eating, drinking, or using washroom facilities.		
RESPIRATOR	Local exhaust.		

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Paste
COLOUR	White
ODOUR	Amine
ODOR THRESHOLD	Not available
OXIDIZING PROPERTIES	Not applicable
SOLUBILITY IN WATER	Soluble
PARTITION COEFFICIENT (n-octanol/water)	Not determined.
SPECIFIC GRAVITY (WATER=1)	2.000
EVAPORATION RATE	Not applicable
VAPOUR PRESSURE	Negligible @ 25°C
VAPOUR DENSITY (Air=1)	Not applicable
VOLATILES (%)	Negligible
VOLATILE ORGANIC COMPOUNDS	Negligible
AUTOIGNITION	Not available
FLASH POINT	> 200 °F

10. STABILITY AND REACTIVITY

STABILITY	Stable
HAZARDOUS DECOMPOSITION PRODUCTS	Material is stable under normal temperatures and pressures.
MATERIALS TO AVOID	Strong oxidizers, Strong Lewis acids, Mineral acids
CONDITIONS TO AVOID	Elevated temperatures
HAZARDOUS DECOMPOSITION PRODUCTS	Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics. Aldehydes

11. TOXICOLOGICAL INFORMATION

ROUTE OF ENTRY	Skin Contact; Eye Contact; Ingestion		
CARCINOGEN	<u>IARC</u>	<u>.NTP</u>	<u>OSHA Substance Specific Regulation</u>
COMPONENT			
Titanium dioxide	Yes (2B)	No	Not Listed

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MSDS DATE 11-January-2008

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

TARGET ORGANS	Eyes; Skin; Respiratory system
RESPIRATORY SENSITIZATION	Sensitizer. May cause allergic reaction.
SKIN SENSITIZATION	Sensitizer. May cause allergic reaction.

PRODUCT TOXICOLOGY

PRODUCT INFORMATION	This health hazard assessment is based on a consideration of the composition of this product.
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COMPONENT	NOTES ON ORAL TOXICITY	NOTES ON ORAL TOXICITY
3,3'-Oxybis(ethyleneoxy)bis(propylamine) Epoxy resin	Oral LD50: Rat 3160 mg/kg Oral LD50: Rat > 5000 mg/kg	Corrosive to mouth, throat and stomach. Unlikely to be hazardous if swallowed.

COMPONENT	NOTES ON DERMAL TOXICITY	NOTES ON DERMAL TOXICITY
3,3'-Oxybis(ethyleneoxy)bis(propylamine) Epoxy resin	Dermal LD50: Rat > 2150 mg/kg Dermal LD50: Rabbit 2500 mg/kg Dermal LD50: Rabbit > 6000 mg/kg	Corrosive. Repeated or prolonged skin contact may result in moderate irritation. Repeated and/or prolonged contact may cause skin sensitization.

COMPONENT	NOTES ON INHALATION TOXICITY	NOTES ON INHALATION TOXICITY
3,3'-Oxybis(ethyleneoxy)bis(propylamine) Epoxy resin		Inhalation of dust or vapor may cause severe irritation to the nasal passages and/or the respiratory system. Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature.

COMPONENT	NOTES ON EYE IRRITATION
3,3'-Oxybis(ethyleneoxy)bis(propylamine) Epoxy resin	Extremely severe irritant/corrosive. May cause severe burns which could lead to permanent damage or total loss of vision. May cause eye irritation.

12. ECOLOGICAL INFORMATION

POTENTIAL TO BIOACCUMULATE	Not available.
AQUATIC TOXICITY	Not available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Disposal should be in accordance with local, state or national legislation.
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MSDS ID: EC180729

MSDS DATE 11-January-2008

EMPTY CONTAINER WARNINGS Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

This section provided for general information only. The shipping description below may not represent requirements for all modes of transportation, packaging, shipping methods or locations outside of the United States.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

T.D.G. CLASS Not Regulated

ICAO/IATA CLASSIFICATION Not classified as dangerous.

15. REGULATORY INFORMATION

WHMIS CLASS	D2A D2B
Canadian Domestic Substance List (DSL)	Is on DSL
TSCA	All components are on the TSCA inventory.
Philippines (PICCS)	On the PICCS Inventory.
EINECS	All components of this product are listed in EINECS or ELINCS, or are otherwise exempt from EU notification requirements.

16. OTHER INFORMATION

HMIS® Hazard Ratings

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs by OSHA's 29 CFR 1910.1200, we choose to provide them as a service to our customers using HMIS®. These ratings are to be used only with a fully implemented HMIS® program. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

NPCA recommends that employers must determine appropriate PPE for the actual conditions under which this product is used in their workplace. For information on PPE codes, consult the HMIS® Implementation Manual.

When two ratings are provided for Health, the first represents the material 'as supplied', and the second represents the material 'in use'.

* = chronic health hazard

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<u>Health</u>	<u>Flammability</u>	<u>Reactivity</u>
*3	1	0

RECOMMENDED USE	Adhesive
MSDS DATE	11-January-2008
PREPARED BY	Emerson & Cuming Product Safety:
	Tel: 978.436.9781
	Fax: 978.436.9707
SECTIONS MODIFIED SINCE PREVIOUS ISSUE	2; 3

NATIONAL STARCH AND CHEMICAL

MSDS ID: EC180729

MSDS DATE 11-January-2008

ADDITIONAL INFORMATION: The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.