

NATIONAL STARCH AND CHEMICAL

MSDS ID: EC600358

MSDS DATE 29-June-2006



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

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS ID: EC600358  
 PRODUCT NAME: CATALYST 11 MIL-I-16923G  
 Catalyst for Epoxy Resin

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. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY	Aromatic Amine		
COMPONENT	CAS NUMBER	CONCENTRATION (% by weight)	
m-Phenylenediamine	108-45-2	>50	
1-Methyl-2-pyrrolidone	872-50-4	20 - 35	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING.  
 CAUSES SEVERE OR PERMANENT DAMAGE TO EYES  
 SEVERE EYE IRRITANT.  
 TOXIC IF SWALLOWED.  
 TOXIC IN CONTACT WITH SKIN.  
 HARMFUL IF SWALLOWED.  
 Possible birth defect hazard.  
 SKIN SENSITIZER.  
 Light Brown Liquid Slight Aromatic odor

EYE: Severe/very severe irritant. May cause permanent damage if eye is not immediately irrigated.

SKIN CONTACT: Can be absorbed through skin causing systemic toxic effects. Repeated or prolonged skin contact may result in severe irritation. Repeated and/or prolonged contact may cause skin sensitization.

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INHALATION	May cause irritation to eyes and respiratory system. The vapor has anesthetic properties and when inhaled at concentrations above the occupational exposure limit, it may cause respiratory irritation, headache, fatigue, dizziness and incoordination. Avoid breathing vapors or mists.
INGESTION	Moderately toxic. Ingestion may cause irritation of the gastrointestinal tract. May cause nausea, vomiting and diarrhea.

#### 4. FIRST-AID MEASURES

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EYE	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 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. If symptoms develop, obtain medical attention.
INHALATION	Remove to fresh air. Administer oxygen to aid breathing. Get medical attention.
INGESTION	If individual is conscious, give milk or water to dilute stomach contents, then induce vomiting. DO NOT attempt to give anything by mouth to a drowsy or unconscious person. Keep warm and quiet. Get prompt medical attention.

#### 5. FIREFIGHTING MEASURES

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AUTOIGNITION	560°C
FLASH POINT	204°F
EXTINGUISHING MEDIA	Alcohol Foam; CO <sub>2</sub> ; Dry Chemical; Water Fog
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. Containers can build up pressure if exposed to heat (fire) and may explode.
HAZARDOUS COMBUSTION PRODUCTS	Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics.
LOWER EXPLOSION LIMIT (%)	Not applicable
UPPER EXPLOSION LIMIT (%)	Not applicable

#### 6. ACCIDENTAL RELEASE MEASURES

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SPILL AND LEAK PROCEDURES	Ventilate area. May cause allergic skin reaction. Use suitable protective clothing. No smoking, flames or flares in hazard area. Keep unnecessary people away; isolate hazard area and deny entry. Contain the spillage and pump up as much as possible. Absorb the remaining material on sand,sawdust,etc,for landfill or incineration. Do not allow to enter drains, sewers or watercourses. Scrape absorbed material into proper waste containers. Wash area with soap and water; prevent entry of wash water into drains or other waterways. Dispose of wastes and water in accordance with all applicable 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

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STORAGE TEMPERATURE	25°C
SHELF LIFE, (Days)	365
HANDLING/STORAGE	Keep containers properly sealed when not in use.

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SENSITIVITY TO STATIC ELECTRICITY  
SPECIAL SENSITIVITY  
SENSITIVITY TO MECHANICAL IMPACT  
OTHER PRECAUTIONS

Keep away from heat and direct sunlight. Keep away from oxidizing agents. Store in cool, dry place.  
Yes  
Avoid moisture contamination.  
No  
Ground containers securely when transferring contents. Wear low static or properly grounded shoes.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	EXPOSURE LIMITS ACGIH	OSHA	Mfg Working Standard
m-Phenylenediamine	0.1 mg/m3 TWA.		
VENTILATION REQUIREMENTS	Use in a well-ventilated area. Local exhaust to keep vapors below TLV.		
EYE PROTECTION REQUIREMENTS	Wear eye/face protection. Safety spectacles/goggles/full face shield. Protect against splashing.		
GLOVE REQUIREMENTS	Employee must wear appropriate protective gloves to prevent contact with this substance. Butyl or natural rubber gloves are recommended. Cotton or other absorbent gloves should not be worn.		
CLOTHING REQUIREMENTS	Employee must wear appropriate protective clothing and equipment to prevent any possibility of skin contact with this substance. Uniforms, coveralls, or a lab coat should be worn. Rubber boots and apron if exposure is severe.		
CHANGE/REMOVAL OF CLOTHING	Remove contaminated clothing and launder before reuse. Discard shoes, belts, wallets, and any other contaminated leather items.		
WASH REQUIREMENTS	Wash exposed areas with soap and water. Showers and eye washing equipment must be provided at handling points.		
RESPIRATOR REQUIREMENTS	NIOSH approved respirator if required. Self-contained breathing apparatus in emergency and non-routine situations.		

### 9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Liquid
COLOR	Light Brown
ODOR	Slight Aromatic
ODOR THRESHOLD	Not available
PH AS IS	Not applicable
pH IN (1%) SOLUTION	Approximately 9.2
OXIDIZING PROPERTIES	Not applicable
BOILING POINT	> 200°C
MELTING/FREEZING POINT	None Established
SOLUBILITY IN WATER	Soluble
PARTITION COEFFICIENT (n-octanol/water)	Approximately -0.4
SPECIFIC GRAVITY (WATER=1)	1.11
BULK DENSITY	9.3lb/gal
EVAPORATION RATE	Not applicable
VAPOR PRESSURE (mmHg)	Estimated to be < 0.345@ 25°C
VAPOR DENSITY (air = 1)	3.4
VOLATILES	28.5%/wt
VOLATILE ORGANIC COMPOUNDS	285g/liter
AUTOIGNITION	560°C

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FLASH POINT 204°F

**10. STABILITY AND REACTIVITY**

STABILITY	Stable
STABILITY DETAIL	Material is stable under recommended storage temperatures and pressures.
MATERIALS TO AVOID	Oxidizers
CONDITIONS TO AVOID	Avoid moisture contamination.
HAZARDOUS DECOMPOSITION PRODUCTS	Thermal decomposition products are hazardous and/or toxic. Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics.
HAZARDOUS POLYMERIZATION CONDITIONS	Hazardous polymerization will not occur.

**11. TOXICOLOGICAL INFORMATION**

ROUTE OF ENTRY Skin Absorption; Ingestion; Eye Contact; Inhalation

<b>CARCINOGEN</b>	<u>IARC</u> <u>(group)</u>	<u>NTP</u>	<u>OSHA Substance</u> <u>Specific Regulation</u>
COMPONENT There is no evidence that this product poses a carcinogenic risk under normal conditions of handling and use.	No	No	Not Listed

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

A component(s) of this product was found to be positive in one or more mutagenetic assays.  
Animal studies show that exposure to NMP(n-Methylpyrrolidone) during pregnancy is harmful to the developing fetus.  
In lifetime feeding and inhalation studies in rats, NMP(n-Methylpyrrolidone) did not cause cancer.  
In lifetime feeding and inhalation studies in mice, NMP(n-Methylpyrrolidone) increased the incidence of liver tumors.  
Animal studies show that exposure to NMP(n-Methylpyrrolidone) does not impair fertility.  
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; Eyes; Respiratory system; Kidneys; Liver; Central nervous system
SKIN SENSITIZATION	Sensitizer. May cause allergic reaction.
POSSIBLE BIRTH DEFECT HAZARD	Yes

**PRODUCT TOXICOLOGY**  
PRODUCT INFORMATION

This health hazard assessment is based on a consideration of the composition of this product.  
Severe/very severe irritant.  
Vapor released during hot processing may be irritant to the respiratory system.

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COMPONENT m-Phenylenediamine	ORAL TOXICITY Oral LD50: Rat 650mg/kg	NOTES ON ORAL TOXICITY Ingestion may cause irritation of the gastrointestinal tract. Slightly toxic. May cause nausea, vomiting and diarrhea.
1-Methyl-2-pyrrolidone	Oral LD50: Mouse 5130 - 5270mg/kg Oral LD50: Rat 3914 - 4990mg/kg	Low oral toxicity.
COMPONENT m-Phenylenediamine	DERMAL TOXICITY	NOTES ON DERMAL TOXICITY Repeated and/or prolonged contact may cause irritation and skin sensitization. Can be absorbed through skin causing systemic toxic effects.
1-Methyl-2-pyrrolidone	Dermal LD50: Rabbit 4 - 8g/kg	Irritating to the skin.
COMPONENT m-Phenylenediamine	INHALATION TOXICITY	NOTES ON INHALATION TOXICITY Atmospheric concentrations in excess of the occupational exposure limit may lead to headache, nausea, and irritation of the eyes, nose and throat. Exposure to high concentrations may produce lung damage. Dust is irritant to the respiratory tract.
1-Methyl-2-pyrrolidone	Inhalation LC50 (4hr): Rat > 5.1mg/l	Vapor may be irritant to the respiratory tract.
COMPONENT m-Phenylenediamine		NOTES ON EYE IRRITATION The vapor and the liquid may cause burning, intense irritation and excessive watering of the eye. Severe/very severe irritant.
1-Methyl-2-pyrrolidone		Will cause eye irritation.

### 12. ECOLOGICAL INFORMATION

POTENTIAL EFFECT ON ENVIRONMENT	Do not allow to enter drains, sewers or watercourses.
MOBILITY	The product is soluble in water.
PERSISTENCE AND DEGRADABILITY	Not readily biodegradable.
POTENTIAL TO BIOACCUMULATE	The product has low potential for bioaccumulation.
ECOTOXICITY	Toxic to aquatic life.
AQUATIC TOXICITY	None Established

### 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

This section provided for general information only.

FOR NON-BULK SHIPMENTS.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE

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SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

### DOT CLASSIFICATION

PROPER SHIPPING NAME	TOXIC, LIQUIDS, ORGANIC, N.O.S.
TECHNICAL NAME	(PHENYLENEDIAMINE)
HAZARD CLASS	6.1
SUB. HAZARD CLASS	
U.N. NUMBER	UN2810
PACKING GROUP	III

### ICAO/IATA CLASSIFICATION

PROPER SHIPPING NAME	TOXIC LIQUID, ORGANIC, N.O.S.
TECHNICAL NAME	(PHENYLENEDIAMINE)
HAZARD CLASS	6.1
SUB. HAZARD CLASS	
U.N. NUMBER	UN2810
PACKING GROUP	III

The information provided herein may not include the impact of additional regulatory requirements (eg, for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/of marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

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## 15. REGULATORY INFORMATION

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TSCA	All components are on the TSCA inventory.
Canadian Domestic Substance List (DSL)	Is on DSL
EINECS	All components of this product are listed in EINECS or ELINCS.

SARA - Section 313 (Superfund Amendments and Reauthorization Act of 1986 - 40CFR 372)	CAS NUMBER
1,3-Phenylenediamine	108-45-2
N-Methyl-2-pyrrolidinone	872-50-4

### CALIFORNIA PROPOSITION 65

WARNING: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.

Unless a concentration is specified in Section 2 of the MSDS, the below chemical/s are present in trace amounts.

COMPONENT	CAS NUMBER
1-Methyl-2-pyrrolidone	872-50-4
o-Phenylenediamine	95-54-5

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## 16. OTHER INFORMATION

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### 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.

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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.

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

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FOR INFORMATION CONTACT:	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.