

# SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:**..... PRO-SET<sup>®</sup> M2046 Hardener  
**APPLICABLE PRODUCT CODES:** ..... M2046, M2046-1, M2046-2, M2046-3, M2046-4, M2046-5  
**CHEMICAL FAMILY:**..... Polyamine-imidazole mixture.  
**INTENDED PRODUCT USES:**..... Curing agent for epoxy resins.  
**PRODUCT RESTRICTIONS:**..... None identified.  
**SDS VERSION:** ..... M2046-2019a

**MANUFACTURER:**  
Gougeon Brothers, Inc.  
100 Patterson Ave.  
Bay City, MI 48706, U.S.A.  
Phone: 888-377-6738 or 989-684-7286  
www.prosetepoxy.com

**EMERGENCY TELEPHONE NUMBERS (24 HRS):**  
Transportation  
CHEMTREC: ..... 800-424-9300 (U.S.)  
703-527-3887 (International)  
Non-transportation  
Poison Hotline: ..... 800-222-1222

## 2. HAZARDS IDENTIFICATION

### Classification of Substance or Mixture

Acute toxicity, Oral, Category 4  
Skin corrosion/irritation, Category 1B  
Skin sensitizer, Category 1  
Eye damage/irritation, Category 1  
Carcinogenicity, Category 2  
Specific target organ toxicity (repeated exposure - oral), Category 2  
Acute aquatic toxicity, Category 3  
Chronic aquatic toxicity, Category 2

### Label Elements

#### Hazard Pictogram(s):



**Signal Word:**  
DANGER

#### Hazard Statements:

H302 Harmful if swallowed  
H314 Causes severe skin burns and eye damage  
H317 May cause an allergic skin reaction  
H351 Suspected of causing cancer  
H372 May cause damage to organs through prolonged or repeated exposure if swallowed  
H402 Harmful to aquatic life  
H411 Toxic to aquatic life with long lasting effects

#### Precautionary Statements:

##### Prevention

P201 Obtain special instructions before use  
P202 Do not handle until all safety precautions have been read and understood  
P260 Do not breathe dust/fume/gas/mist/vapors/spray  
P264 Wash hands thoroughly after handling  
P270 Do not eat, drink or smoke when using this product  
P272 Contaminated work clothing should not be allowed out of the workplace  
P273 Avoid release to the environment  
P280 Wear protective gloves/protective clothing/eye protection/face protection

##### Response

P301 + P330 + 331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse or wash skin with soap and water (or shower).  
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing  
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P313 IF exposed or concerned: Get medical attention/advice  
P310 Immediately call POISON CENTER or doctor.  
P333 + P313 If irritation or rash occurs: Get medical attention/advice

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P362 + P364 Take of contaminated clothing and wash it before reuse  
P391 Collect spillage  
Storage  
P405 Store locked up.  
Disposal  
P501 Dispose of contents and container according to local, state, national and International regulations

## Other Hazards

None known.

### 3. COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

INGREDIENT NAME	CAS #	CONCENTRATION (%)
Formaldehyde, polymer with benzeneamine, hydrogenated	135108-88-2	15-40
Methylenebiscyclohexanamine, 4,4'-	1761-71-3	10-30
Polyoxypropylenediamine	9046-10-0	10-30
Isophoronediamine	2855-13-2	10-30
2-ethyl-4-methylimidazole	931-36-2	1-5
4-Methylimidazole	822-36-6	0.1-1

The exact chemical identity and/or exact percentage (concentration) of each ingredient may be held as confidential business information (CBI). Any ingredient not disclosed in this section may have been determined not to be hazardous to health or the environment, or it may be present at a level below its disclosure threshold.

### 4. FIRST AID MEASURES

**FIRST AID FOR EYES**..... SYMPTOMS: Causes eye burns and eye damage. RESPONSE: Flush immediately with water for at least 15 minutes. Remove contact lenses if present and easy to do. Immediately call a POISON CONTROL CENTER or doctor.

**FIRST AID FOR SKIN**..... SYMPTOMS: Causes skin burns, redness and irritation. May cause allergic skin reaction and sensitization. RESPONSE: Immediately wash skin with soap and water. Immediately call a POISON CONTROL CENTER or doctor.

**FIRST AID FOR INHALATION**..... SYMPTOMS: Can cause respiratory irritation, shortness of breath or cough. RESPONSE: Remove to fresh air if effects occur and keep comfortable for breathing. Seek medical attention if symptoms persist or you feel unwell.

**FIRST AID FOR INGESTION**..... SYMPTOMS: May cause gastrointestinal irritation or ulceration. May cause burns of the mouth and throat. RESPONSE: Rinse mouth with water. DO NOT induce vomiting. If vomiting should occur, keep airway clear. Immediately call POISON CONTROL CENTER or doctor.

### 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** ..... SUITABLE: Foam, carbon dioxide (CO<sub>2</sub>), dry chemical. NON-SUITABLE: Direct water stream.

**FIRE AND EXPLOSION HAZARDS:** ..... During a fire, smoke may contain the original materials in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include, but are not limited to: oxides of nitrogen, carbon monoxide, carbon dioxide, volatile amines, ammonia, nitric acid, nitrosamines. When mixed with sawdust, wood chips, or other cellulosic material, spontaneous combustion can occur under certain conditions. Heat is generated as the air oxidizes the amine. If the heat is not dissipated quickly enough, it can ignite the sawdust.

**SPECIAL FIRE FIGHTING PROCEDURES:** ..... Use full-body protective gear and a self-contained breathing apparatus. Use of water may generate toxic aqueous solutions. Do not allow water run-off from fighting fire to enter drains or other water courses.

### 6. ACCIDENTAL RELEASE MEASURES

**EMERGENCY PROCEDURES:** ..... Keep unnecessary and unprotected personnel from entering area. Use appropriate safety and personal protective equipment as indicated in Section 8.

**MITIGATION AND CLEAN UP PROCEDURES:** ..... Stop leak without additional risk. Isolate area. Dike and absorb with inert material (e.g., sand) and collect in a suitable, closed container. Do not use sawdust, wood chips or other cellulosic materials to absorb the spill, as the possibility for spontaneous combustion exists. Warm, soapy water may be used to clean residual.

**ENVIRONMENTAL PRECAUTIONS:**..... Prevent from entering into soil, ditches, sewers, waterways and groundwater. See Section 12 for environmental impact information.

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## 7. HANDLING AND STORAGE

**STORAGE TEMPERATURE (min./max.):** ..... 40°F (4°C) / 90°F (32°C).

**STORAGE:** ..... Store in cool, dry place away from high temperatures and moisture. Keep container tightly closed. Store in a secure location with restricted access or store locked up.

**HANDLING PRECAUTIONS:** ..... Use with adequate ventilation. Do not breathe vapors or mists from heated material. Avoid exposure to concentrated vapors. Avoid skin and eye contact. Wash thoroughly after handling. When mixed with epoxy resin this product causes an exothermic reaction, which in large masses, can produce enough heat to damage or ignite surrounding materials and emit fumes and vapors that vary widely in composition and toxicity. Do not breathe vapors or fumes from uncontrolled exotherming masses.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS:** ..... Use with adequate general ventilation and/or local ventilation to keep exposures below established limits.

**EYE PROTECTION GUIDELINES:** ..... Chemical splash-proof goggles or face shield.

**SKIN PROTECTION GUIDELINES:** ..... Wear liquid-proof, chemical resistant gloves (nitrile-butyl rubber, neoprene, butyl rubber or natural rubber) and full body-covering clothing.

**RESPIRATORY PROTECTION GUIDELINES:** ..... When ventilation cannot be made adequate enough to keep exposures below established limits, use a NIOSH approved respirator with an organic vapor cartridge, organic vapor cartridge + P100, or a multi-contaminant cartridge, depending on specific workplace conditions. Consult with your respirator and cartridge supplier to ensure proper selection of respirator and cartridge based on ingredients listed in Section 3 and specific workplace conditions. Use and select a respirator according the guidelines established in OSHA 1910.134 or other applicable respiratory protection standard.

**ADDITIONAL PROTECTIVE MEASURES:** ..... Use where there is immediate access to safety shower and emergency eye wash. Wash thoroughly after use. Contact lens should not be worn when working with this material. Generally speaking, working cleanly and following basic precautionary measures will greatly minimize the potential for harmful exposure to this product under normal use conditions.

**OCCUPATIONAL EXPOSURE LIMITS:** ..... Exposure limits may not be established for this product as a whole. For established exposure limits of specific ingredients in this product, or other available exposure limit information, refer to the table below.

Ingredient Name	CAS#	Exposure Limit Information
Formaldehyde, polymer with benzeneamine, hydrogentated	135108-88-2	No data available
Methylenebiscyclohexanamine, 4,4'-	1761-71-3	No data available
Polyoxypropylenediamine	9046-10-0	No data available
Isophoronediamine	2855-13-2	No data available
2-ethyl-4-methylimidazole	931-36-2	No data available
4-Methylimidazole	822-36-6	No data available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL FORM:** ..... Liquid.

**COLOR:** ..... Amber

**ODOR:** ..... Ammonia-like

**ODOR THRESHOLD:** ..... No data available

**pH:** ..... 11.5

**MELTING POINT / FREEZING POINT** ..... No data.

**BOILING POINT (760mm/Hg):** ..... > 400°F (204°C) estimated based on similar product.

**FLASH POINT:** ..... Estimated > 200°F (93°C) estimated based similar product.

**AUTO IGNITION TEMPERATURE** ..... No data.

**LOWER EXPLOSIVE LIMIT (LEL)** ..... No data.

**UPPER EXPLOSIVE LIMIT (UEL)** ..... No data.

**VAPOR PRESSURE** ..... < 1 mmHg @ 20°C (estimated based on ingredient data).

**SPECIFIC GRAVITY/DENSITY (water = 1)** ..... 0.96

**BULK DENSITY** ..... 8.00 lbs./gal. (0.96 kg/L)

**VAPOR DENSITY (air = 1)** ..... No data.

**EVAPORATION RATE (Butyl Acetate = 1)** ..... No data.

**WATER SOLUBILITY (% BY WT.)** ..... No data.

**PARTITION COEFFICIENT, n-OCTANOL/WATER (log Pow)** ..... No data.

**KINEMATIC VISCOSITY:** ..... 88.5 (mm<sup>2</sup>/s @ 20°C)

**DECOMPOSITION TEMPERATURE:** ..... No data available.

**% VOLATILE BY WEIGHT:** ..... ASTM 2369-07 was used to determine the Volatile Matter Content of mixed epoxy resin and hardener. The combined VOC content for the resin and hardener system is listed below.

<u>Resin/Hardener</u>	<u>VOC Content</u>	
	<u>(g/L)</u>	<u>(lb/gal)</u>
M1038 / M2046.....	3.13	0.03

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M1002 / M2046.....	4.55	0.04
XR29A / M2046.....	17.8	0.15
M1042 / M2046.....	5.97	0.05

**10. STABILITY AND REACTIVITY**

**STABILITY:**..... Product is stable at normal temperatures and pressures.

**REACTIVITY / HAZARDOUS REACTIONS:**..... Product will not react by itself. A mass of more than one pound of product plus an epoxy resin will cause irreversible polymerization with significant heat buildup and pressure.

**INCOMPATIBILITIES:**..... Avoid organic and mineral acids, oxidizing materials, halogenated organic compounds (e.g., methylene chloride), nitrosating agents, sodium hypochlorite. External heating or self-heating could result in rapid temperature increase and pressure build up. If such a condition were to occur in a drum, the drum could expand and rupture violently.

**CONDITIONS TO AVOID:**..... Avoid excessive heat.

**DECOMPOSITION PRODUCTS:**..... Very toxic fumes and gases when burned or otherwise heated to decomposition. Decomposition products may include, but not limited to: oxides of nitrogen, volatile amines, ammonia, nitric acid, nitrosamines.

**11. TOXICOLOGICAL INFORMATION**

Ingredient Name	CAS#	LD <sub>50</sub> Oral	LD <sub>50</sub> Dermal	LC <sub>50</sub> Inhalation
Formaldehyde, polymer with benzeneamine, hydrogenated	135108-88-2	No data	No data	No data
Methylenebiscyclohexanamine, 4,4'-	1761-71-3	380 mg/kg	>1000	No data
Polyoxypropylenediamine	9046-10-0	2855 mg/kg	2980 mg/kg	>0.74 mg/L 8h mist
Isophoronediamine	2855-13-2	1030 mg/kg	>2000	>5.01 mg/l 4h mist
2-ethyl-4-methylimidazole	931-36-2	731-1000 mg/kg	>400 mg/kg	No data
4-Methylimidazole	822-36-6	350-751 mg/kg	440 mg/kg	No data

**ACUTE TOXICITY:**..... No specific toxicity data exists for this mixture. Classification is based on acute toxicity estimation methods using ingredient data.

Oral:..... Category 4. Harmful if swallowed . May cause gastrointestinal irritation or ulceration. May cause burns of the mouth and throat.

Dermal:..... Not classified. Does not meet classification criteria.

Inhalation:..... Not classified. Does not meet classification criteria.

**SKIN CORROSION / IRRITATION:**..... Category 1B. Causes severe skin burns. Effects may be immediate. May cause persistent irritation or dermatitis.

**SERIOUS EYE DAMAGE / IRRITATION:**..... Category 1. Causes serious eye damage. May cause blurred vision. May cause corneal damage resulting in vision impairment or even blindness.

**RESPIRATORY SENSITIZATION:**..... No data available.

**SKIN SENSITIZATION:**..... Category 1. May cause allergic skin reaction..

**REPRODUCTIVE TOXICITY:**..... Not classified. Does not meet classification criteria.

**MUTAGENICITY:**..... Not classified. Does not meet classification criteria.

**CARCINOGENICITY:**..... Category 2. Suspected of causing cancer.

A component in this product, 4-Methyleimidazole, present at less than 0.5%, is suspected of causing cancer and is listed by IARC as a Group 2B carcinogen. Under the conditions of 2-year NTP feed studies, there was no evidence of carcinogenic activity of 4-Methylimidazole in male rats exposed to 625, 1,250 and 2,500 ppm. There was equivocal evidence of carcinogenic activity of 4-Methylimidazole in female rats based on increased incidences of mononuclear cell leukemia. There was clear evidence of carcinogenic activity of 4-Methylimidazole in male and female mice based on increased incidences of alveolar/bronchiolar neoplasms.

**SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):**..... Not classified. Does not meet classification criteria.

**SPECIFIC TARGET ORGAN TOXICITY (Repeated Exposure):**..... STOT RE Category 2. May cause damage to organs through prolonged or repeated exposure if swallowed. Repeated ingestion can result in damage to the following organs/biological systems: liver, muscles, skeletal.

Formaldehyde, polymer with benzeneamine, hydrogenated (cycloaliphatic polyamines) was tested in rats for systemic effects in a sub-chronic (28-day) oral study at doses ranging from 15 – 300 mg/kg/day. Effects seen at 300 mg/kg/day included decreased survival, decreased body weight gain, increased liver, kidney, and adrenal weights, and histological changes in the liver, kidney, adrenals and spleen. The No-Observed-Adverse-Effect-Level (NOAEL) was 15 mg/kg/day.

**ASPIRATION HAZARD:**..... Not classified. Does not meet classification criteria.

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**OTHER HEALTH HAZARD INFORMATION:**..... This product is corrosive to skin and mucous membrane tissues. As a result of this identified hazard, it is anticipated that excessive inhalation of vapors may also cause irritation to the respiratory tract.

**12. ECOLOGICAL INFORMATION**

**ACUTE AQUATIC TOXICITY:**..... No specific test data available for the mixture. Calculated Estimate: Aquatic Acute Category 3. Harmful to aquatic life. Avoid release to the environment.

**CHRONIC AQUATIC TOXICITY:**..... No specific test data available for the mixture. Calculated Estimate: Aquatic Chronic Category 2. Toxic to aquatic life with long lasting effects. Avoid release to the environment.

**PERSISTENCE AND BIODEGRADABILITY:** ..... No specific test data available for the mixture.

**MOBILITY IN SOIL:** ..... No specific test data available for the mixture.

**ADDITIONAL ECOTOXICITY INFORMATION:**..... In the liquid, uncured state, this product may be harmful to aquatic life with long lasting effects. Prevent release to the environment, sewers and natural waters.

Ingredient	CAS#	Ecotoxicity Classification Information
Formaldehyde, polymer with benzeneamine, hydrogenated	135108-88-2	Not classified
Methylenebis(cyclohexanamine, 4,4'-	1761-71-3	Acute Aquatic Cat. 2; Chronic Aquatic Cat. 2
Polyoxypropylenediamine	9046-10-0	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 2
Isophoronediamine	2855-13-2	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
2-ethyl-4-methylimidazole	931-36-2	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
4-Methylimidazole	822-36-6	Not classified

**13. DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:**..... Evaluation of this product using RCRA criteria shows that it is not a hazardous waste, either by listing or characteristics, in its purchased form. It is the responsibility of the user to determine proper disposal methods.

Incinerate, recycle (fuel blending) or reclaim may be preferred methods when conducted in accordance with federal, state and local regulations.

**14. TRANSPORTATION INFORMATION**

**US DOT**

UN NUMBER:..... UN 2735  
 SHIPPING NAME:..... Polyamines, liquid, corrosive, n.o.s.  
 TECHNICAL SHIPPING NAME:..... Cycloaliphatic amine  
 HAZARD CLASS:..... Class 8  
 PACKING GROUP:..... PG III  
 MARINE POLLUTANT:..... No

**CANADA TDG**

UN NUMBER:..... UN 2735  
 SHIPPING NAME:..... Polyamines, liquid, corrosive, n.o.s.  
 TECHNICAL SHIPPING NAME:..... Cycloaliphatic amine  
 HAZARD CLASS:..... Class 8  
 PACKING GROUP:..... PG III  
 MARINE POLLUTANT:..... No

**IMDG**

UN NUMBER:..... UN 2735  
 SHIPPING NAME:..... Polyamines, liquid, corrosive, n.o.s.  
 TECHNICAL SHIPPING NAME:..... Cycloaliphatic amine  
 HAZARD CLASS:..... Class 8  
 PACKING GROUP:..... PG III  
 EmS Number:..... F-A, S-B  
 MARINE POLLUTANT..... Yes

**ICAO/IATA**

UN NUMBER:..... UN 2735  
 SHIPPING NAME:..... Polyamines, liquid, corrosive, n.o.s.  
 TECHNICAL SHIPPING NAME:..... Cycloaliphatic amine  
 HAZARD CLASS:..... Class 8  
 PACKING GROUP:..... PG III  
 MARINE POLLUTANT:..... Yes

**15. REGULATORY INFORMATION**

COUNTRY	INVENTORY LIST	STATUS

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United States	TSCA	All ingredients are listed or otherwise compliant.
Europe	EINECS or ELINCS	All ingredients are listed or otherwise compliant.
Canada	CEPA (DSL/NDSL)	All ingredients are listed or otherwise compliant.
Australia	AICS	All ingredients are listed or otherwise compliant.
Japan	ENCS	All ingredients are listed or otherwise compliant.
South Korea	KECI	All ingredients are listed or otherwise compliant.
China	IECSC	All ingredients are listed or otherwise compliant.
Philippines	PICCS	All ingredients are listed or otherwise compliant.

**US EPA TSCA Requirements:**..... No data available.

**Canada WHMIS Confidential Business Information (CBI):**.....No data available.

**US EPA SARA TITTLE III Reporting and Notification Requirements:**

- Subject to Section 302 (TPQ)..... No data available.
- Subject to Section 304 (RQ)..... No data available.
- Subject to Section 311 or 312 ..... Refer to the health and physical classifications in Section 2.
- Subject to Section 313 ..... No data available.

**US STATE REGULATORY INFORMATION:**

The following chemicals may be specifically regulated by individual states. For details on state regulatory requirements you should contact the appropriate state agency.

**COMPONENT NAME  
/CAS NUMBER**

**STATE CODE**

Propylene oxide		
75-56-9	< 0.003%	<sup>1</sup> CA
4-Methylimidazole		
822-36-6		<sup>1</sup> CA

<sup>1</sup>: These substances are known to the state of California to cause cancer or reproductive harm, or both.

**16. OTHER INFORMATION**

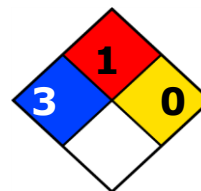
**REASON FOR ISSUE:**..... Updates to sections 3, 8, 11 & 15.  
**PREPARED BY:**..... Gougeon Brothers, Inc.  
**SDS CONTACT:**..... safety@gougeon.com  
**TITLE:**..... Health, Safety & Environmental Manager  
**APPROVAL DATE:**..... January 15, 2019  
**SUPERSEDES DATE:**..... October 11, 2016  
**SDS VERSION:**..... M2046-2019a

**OTHER HAZARD INFORMATION AND RATING SYSTEMS:**

**HMIS® RATING**

<b>HEALTH:</b>	<b>3</b>
<b>FLAMMABILITY:</b>	<b>1</b>
<b>PHYSICAL HAZARD:</b>	<b>0</b>
<b>PERSONAL PROTECTION:</b>	

**NFPA® 704 CODES**



*Approximate HMIS and NFPA Risk Ratings Legend:*  
 0 = Low or None; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe

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