

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:..... PRO-SET® HTP-284 Hardener
APPLICABLE PRODUCT CODES: HTP-284, HTP-284-1, HTP-284-2, HTP-284-QC-3, HTP-284-QC-4, HTP-284-QC-5
CHEMICAL FAMILY:..... Polyamine-imidazole mixture.
INTENDED PRODUCT USES:..... Curing agent for epoxy resins.
PRODUCT RESTRICTIONS: None identified.
SDS VERSION: HTP-284-2019a

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
Acute toxicity, Dermal, 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
Specific target organ toxicity (single exposure), Category 3
Acute aquatic toxicity, Category 2
Chronic aquatic toxicity, Category 2

Label Elements

Hazard Pictogram(s):



Signal Word:
DANGER

Hazard Statements:

H302 Harmful if swallowed
H312 Harmful in contact with skin
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H335 May cause respiratory irritation
H351 Suspected of causing cancer
H372 May cause damage to organs through prolonged or repeated exposure if swallowed
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
P271 Use only outdoors or in a well-ventilated area
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

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P305 + P351 + P338 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 a POISON CENTER or doctor.
P314 Get medical advice/attention if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical attention/advice
P362 + P364 Take off contaminated clothing and wash it before reuse
P391 Collect spillage
Storage
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
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 (%) |
|---|------------|-------------------|
| Polymer of epichlorohydrin / bisphenol A and diethylenetriamine | 31326-29-1 | 15-40 |
| 1,3-cyclohexanedimethanamine | 2579-20-6 | 10-30 |
| Methylenebis(cyclohexanamine, 4,4'- | 1761-71-3 | 10-30 |
| Diethylenetriamine | 111-40-0 | 7-13 |
| 2-ethyl-4-methylimidazole | 931-36-2 | 1-5 |
| 4-Methylimidazole | 822-36-6 | 0.1-1.5 |

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. Immediately call POISON CONTROL CENTER or doctor.

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.
NOTES TO PHYSICIAN: Use of gastric lavage or emesis is contraindicated. Although product does not meet criteria for aspiration toxicity, vomitus may cause lung injury. Possible perforation of stomach or esophagus should be investigated. Consider endotracheal/esophageal control if lavage is done. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: SUITABLE: Foam, carbon dioxide (CO₂), 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.

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: DO NOT spray apply or heat this product. Use only outdoors or with adequate ventilation. If ventilation cannot be made adequate, refer to respiratory protection in Section 8. Do not breathe vapors or mists from heated material. Do not breathe 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. Use of an impervious material may be used for areas of the skin more likely to come in contact.

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 |
|---|------------|----------------------------|
| Polymer of epichlorohydrin / bisphenol A and diethylenetriamine | 31326-29-1 | No data available |
| 1,3-cyclohexanedimethanamine | 2579-20-6 | No data available |
| Methylenebiscyclohexanamine, 4,4'- | 1761-71-3 | No data available |
| Diethylenetriamine | 111-40-0 | 1 ppm TWA ACHIH, (SKIN) |
| 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: Slightly amber.
ODOR: Ammonia-like
ODOR THRESHOLD: No data available
pH: 11.86
MELTING POINT / FREEZING POINT No data available
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 available.
LOWER EXPLOSIVE LIMIT (LEL) No data available.
UPPER EXPLOSIVE LIMIT (UEL) No data available.
VAPOR PRESSURE < 1 mmHg @ 20°C (estimated based on ingredient data).
SPECIFIC GRAVITY/DENSITY (water = 1) 1.003
BULK DENSITY 8.37 lbs./gal. (1.003 kg/L)

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VAPOR DENSITY (air = 1) No data.
 EVAPORATION RATE (Butyl Acetate = 1) No data.
 WATER SOLUBILITY (% BY WT.) No data available.
 PARTITION COEFFICIENT, n-OCTANOL/WATER (log Pow)..... No data available.
 KINEMATIC VISCOSITY: 239.3 mm²/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.

| Resin/Hardener | VOC Content | |
|-------------------|-------------|------------|
| | (g/L) | (lbs./gal) |
| HTP-182 / HTP-284 | 2.06 | 0.02 |

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 ₅₀ Oral | LD ₅₀ Dermal | LC ₅₀ Inhalation |
|---|------------|--|---|--|
| Polymer of epichlorohydrin / bisphenol A and diethylenetriamine | 31326-29-1 | Refer to Diethylenetriamine data; ATPE (500 mg/kg) | Refer to Diethylenetriamine data; ATPE (1100 mg/kg) | No data available. Refer to Diethylenetriamine data. |
| 1,3-cyclohexanedimethanamine | 2579-20-6 | 700-780 mg/kg | 1700 mg/kg | No data |
| Methylenebiscyclohexanamine, 4,4'- | 1761-71-3 | 380 mg/kg | >1000 | No data |
| Diethylenetriamine | 111-40-0 | 1620 mg/kg | 1090 mg/kg | ¹ 0.07 – 0.3 mg/L 4hr aerosol/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 |

Note: Results in this table were derived using the appropriate rat and rabbit species unless otherwise noted.

¹ LC₅₀ data has been generated for this substance by subjecting rats to an airborne aerosol/mist atmosphere in a test chamber. It has not been determined that this data directly correlates to an inherent hazard of this product as would be expected under normal, foreseeable or anticipated conditions of use.

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: Category 4. Harmful in contact with skin. Can be absorbed through the skin in harmful amounts.
 Inhalation:..... Not classified. Based on available data 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:..... Not classified. Based on available data does not meet classification criteria.

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

REPRODUCTIVE TOXICITY:..... Not classified. Based on available data does not meet classification criteria.

MUTAGENICITY:..... Not classified. Based on available data 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):..... STOT SE Category 3. May cause irritation to the upper respiratory tract.

This product contains a component (diethylenetriamine) that is highly toxic by inhalation when aerosolized due to spraying or when a mist is formed due to heating. It is advised that exposure not occur to product that is sprayed or heated. While this product does not meet the classification for a respiratory sensitizer, components of this product can cause aggravation of existing respiratory conditions, such as asthma.

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.

ASPIRATION HAZARD: Not classified. Based on available data does not meet classification criteria.

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/aerosol/mist may also be corrosive to the respiratory system.

12. ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:..... No specific test data available for the mixture. Calculated Estimate: Aquatic Acute Category 2. Toxic 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 |
|---|------------|--|
| Polymer of epichlorohydrin / bisphenol A and diethylenetriamine | 31326-29-1 | Not classified |
| 1,3-cyclohexanedimethanamine | 2579-20-6 | Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3 |
| Methylenebis(cyclohexanamine, 4,4'- | 1761-71-3 | Acute Aquatic Cat. 2; Chronic Aquatic Cat. 2 |
| Diethylenetriamine | 111-40-0 | Not classified |
| 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: 1,3-cyclohexanedimethanamine
 HAZARD CLASS: Class 8
 PACKING GROUP: PG II
 MARINE POLLUTANT: No

CANADA TDG

UN NUMBER: UN 2735
 SHIPPING NAME: Polyamines, liquid, corrosive, n.o.s.
 TECHNICAL SHIPPING NAME: 1,3-cyclohexanedimethanamine
 HAZARD CLASS: Class 8
 PACKING GROUP: PG II
 MARINE POLLUTANT: No

IMDG

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UN NUMBER: UN 2735
 SHIPPING NAME: Polyamines, liquid, corrosive, n.o.s.
 TECHNICAL SHIPPING NAME: 1,3-cyclohexanedimethanamine
 HAZARD CLASS: Class 8
 PACKING GROUP: PG II
 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: 1,3-cyclohexanedimethanamine
 HAZARD CLASS: Class 8
 PACKING GROUP: PG II
 MARINE POLLUTANT: Yes

15. REGULATORY INFORMATION

| COUNTRY | INVENTORY LIST | STATUS |
|---------------|------------------|--|
| 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 Specific 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 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

4-Methylimidazole
 822-36-6
 Diethylenetriamine
 111-40-0
 1,3-cyclohexanedimethanamine
 2579-20-6

STATE CODE

¹CA
 PA
 PA, NJ

¹: 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.
SDS CONTACT: safety@gougeon.com
TITLE: Director of Product Safety and Regulatory Compliance
APPROVAL DATE: January 15, 2019
SUPERSEDES DATE: March 19, 2018
SDS VERSION: HTP-284-2019a.

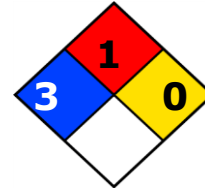
OTHER HAZARD INFORMATION AND RATING SYSTEMS:

HMIS® RATING

NFPA® 704 CODES

PRO-SET® HTP-284 Hardener

| | |
|-----------------------------|----------|
| HEALTH: | 3 |
| FLAMMABILITY: | 1 |
| PHYSICAL HAZARD: | 0 |
| PERSONAL PROTECTION: | |



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

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