

# SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:**..... WEST SYSTEM® G/flex® 650 Part B Hardener  
**APPLICABLE PRODUCT CODES:** ..... 650B, 650-CH, 650-EH  
**CHEMICAL FAMILY:**..... Rubber modified-polyamine mixture.  
**INTENDED PRODUCT USES:**..... Curing agent for epoxy resins.  
**PRODUCT RESTRICTIONS:**..... None identified.  
**SDS VERSION:** ..... 650B-2019a

**MANUFACTURER:**  
Gougeon Brothers, Inc.  
100 Patterson Ave.  
Bay City, MI 48706, U.S.A.  
Phone: 866-937-8797 or 989-684-7286  
www.westsystem.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

Skin corrosion/irritation, Category 2  
Skin sensitizer, Category 1  
Eye damage/irritation, Category 1

### Label Elements

#### Hazard Pictogram(s):



**Signal Word:**  
DANGER

**Hazard Statements:**  
H315 Causes skin irritation  
H317 May cause an allergic skin reaction  
H318 Causes serious eye damage

#### **Precautionary Statements:**

##### Prevention

P261 Avoid breathing dust/fumes/gas/mists/vapors/spray  
P264 Wash hands thoroughly after handling  
P272 Contaminated work clothing should not be allowed out of the workplace  
P280 Wear protective gloves/protective clothing/eye protection/face protection

##### Response

P302 + P352 IF ON SKIN: Wash with plenty of water and soap.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P333 + P313 If skin irritation or rash occurs: Get medical attention/advice  
P337 + P313 If eye irritation persists: Get medical attention/advice  
P362 + P364 Take off contaminated clothing and wash it before reuse

##### 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 (%)
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4	30-60
Non-hazardous	Not Available	10-30
Triethylenetetramine	112-24-3	5-10

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Benzene-1,3-dimethanamine	1477-55-0	3-7
Phenol, 2,4,6-tris[(dimethylamino)methyl] reaction products with triethylenetetramine	1101788-77-5	1-5
Tris-2, 4, 6-(dimethylaminomethyl) phenol	90-72-2	1-5
Aminoethylpiperazine	140-31-8	1-5
Tetraethylenepentamine	112-57-2	1-5

The exact chemical identity and/or exact percentage (concentration) of each ingredient may be held as a trade secret. Any ingredient not disclosed may have been determined not to pose a health or environmental hazard, or may only be present in concentrations that do not require disclosure. Refer to Section 15 for additional information regarding a CBI claim.

## 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: May cause skin burns, redness and irritation. May cause allergic skin reaction and sensitization. RESPONSE: Immediately wash skin with soap and water. Seek medical advice if effects develop and persist.

**FIRST AID FOR INHALATION:**..... SYMPTOMS: Can cause respiratory irritation and possible central nervous system effects. RESPONSE: Remove to fresh air if effects occur and keep comfortable for breathing. Seek medical assistance if effects develop and persist.

**FIRST AID FOR INGESTION:**..... SYMPTOMS: May cause gastrointestinal irritation or ulceration. 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, oxides of carbon, volatile amines, ammonia, nitric acid, aldehydes, 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:** ..... This product is not considered a fire hazard, but will burn if ignited. Hot vapor or mists may be susceptible to spontaneous combustion when mixed with air. Ignition temperatures decrease with vapor volume and vapor/air contact time, and are influenced by pressure changes. Therefore, ignition may occur below published ignition temperatures. Use of this product in processes involving elevated temperatures, vacuum (if subject to sudden ingress of air), or sudden escape of vapor or mist, etc., must be thoroughly evaluated to ensure a safe operation. 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. Store away from incompatible materials and conditions listed in Section 10.

**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

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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.

## 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
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperaziny)ethyl]amino]butyl-terminated	68683-29-4	No data available
Non-hazardous	Not Available	No data available
Triethylenetetramine	112-24-3	AIHA WEEL: 1 ppm ; 6 mg/ m3; Absorbed via skin 0.1 mg/m3 SKIN, Ceiling NIOSH; OSHA Z1A
Benzene-1,3-dimethanamine	1477-55-0	Remarks: potential for skin absorption
Phenol, 2,4,6-tris[(dimethylamino)methyl] reaction products with triethylenetetramine	1101788-77-5	(Reference Triethylenetetramine, CAS# 112-24-3) AIHA WEEL: 1 ppm ; 6 mg/ m3; Absorbed via skin
Tris-2, 4, 6-(dimethylaminomethyl) phenol	90-72-2	No data available
Aminoethylpiperazine	140-31-8	No data available
Tetraethylenepentamine	112-57-2	AIHA WEEL: 1 ppm ; 5 mg/ m3; SKIN, DSEN

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL FORM:** ..... Viscous liquid.  
**COLOR:** ..... Caramel colored.  
**ODOR:** ..... Amine-like odor  
**ODOR THRESHOLD:** ..... No data available.  
**pH:** ..... 10.96  
**MELTING POINT / FREEZING POINT:** ..... No data available.  
**BOILING POINT (760mm/Hg):** ..... No data available.  
**FLASH POINT:** ..... > 300°F(149°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:** ..... No data available.  
**SPECIFIC GRAVITY/DENSITY (water = 1):** ..... 0.97  
**BULK DENSITY:** ..... 8.08 lbs./gal. (0.97 kg/L)  
**VAPOR DENSITY (air = 1):** ..... No data available.  
**EVAPORATION RATE (Butyl Acetate = 1):** ..... No data available.  
**WATER SOLUBILITY (% BY WT.):** ..... No data available.  
**PARTITION COEFFICIENT, n-OCTANOL/WATER (log Pow):** ..... No data available.  
**KINEMATIC VISCOSITY:** ..... 19,587 (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>	<b>VOC Content</b>	
	<b>(g/L)</b>	<b>(lbs/gal)</b>
650A/650B.....	8.6	0.07

## 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 mixed with an epoxy resin will cause irreversible polymerization with significant heat buildup. Strong acids can cause polymerization.

**INCOMPATIBILITIES:** ..... Avoid acids, oxidizing materials, halogenated organic compounds (e.g., methylene chloride). 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, ignition sources.

**DECOMPOSITION PRODUCTS:** ..... Very toxic fumes and gases when burned or otherwise heated to decomposition. Decomposition products may include, but not limited to: oxides of carbon, 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
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4	>15,400 mg/kg	>3000 mg/kg	No data available
Non-hazardous	Not Available	No data available	No data available	No data available
Triethylenetetramine	112-24-3	1716 mg/kg 980 mg/kg	1465 mg/kg 2000 mg/kg	No data 1.34 mg/l 4h mist / aerosol
Benzene-1,3-dimethanamine	1477-55-0			
Phenol, 2,4,6-tris[(dimethylamino)methyl] reaction products with triethylenetetramine	1101788-77-5	1716 mg/kg (reference Triethylenetetramine)	1465 mg/kg	No data
Tris-2, 4, 6-(dimethylaminomethyl) phenol	90-72-2	2169 mg/kg	No data available	No data available
Aminoethylpiperazine	140-31-8	2097 mg/kg	866 mg/kg	No data
Tetraethylenepentamine	112-57-2	2140 - 3990 mg/kg	660-1260 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: ..... Not classified. Based on available data product does not meet acute dermal toxicity classification criteria. Ingestion may result in gastrointestinal tract discomfort.

Dermal: ..... Not classified. Based on available data product does not meet acute dermal toxicity classification criteria.

Inhalation:..... Not classified. Based on available data product does not meet acute inhalation toxicity classification criteria.

**SKIN CORROSION / IRRITATION:**..... Category 2. Causes skin irritation. In vivo tests indicate this product is not corrosive to skin tissue; however, a component in this product is classified as a 1B corrosive.

**SERIOUS EYE DAMAGE / IRRITATION:**..... Category 1. Causes serious eye damage.

**RESPIRATORY SENSITIZATION:**..... Not classified. Based on available data this product does not meet classification criteria.

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

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

**MUTAGENICITY:**..... Not classified. Based on available data this product does not meet classification criteria. A component in this product, aminoethylpiperazine (CAS# 140-31-8), showed positive mutagenic effects in Sister Chromatid Exchange in *in-vitro* testing, but showed no mutagenic activity in the Ames test, mouse lymphoma (*in vitro*), or *in-vivo* micronucleus test (mice) assays.

**CARCINOGENICITY:**..... Not classified. Based on available data this product does not meet classification criteria.

**SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):**..... No classified. Based on available data this product does not meet classification criteria. However, it is anticipated that inhalation of concentrated vapors or fumes from heated product may cause irritation to the respiratory track and central nervous system effects.

**SPECIFIC TARGET ORGAN TOXICITY (Repeated Exposure):** ..... Not classified. Based on available data this product does not meet classification criteria.

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

**OTHER HEALTH HAZARD INFORMATION:**..... None known.

**12. ECOLOGICAL INFORMATION**

**ACUTE AQUATIC TOXICITY:**..... No specific test data available for the mixture. Calculated Estimate: Not classified. Does not meet acute aquatic toxicity classification criteria. Avoid release to the environment.

**CHRONIC AQUATIC TOXICITY:** ..... No specific test data available for the mixture. Calculated Estimate: Not classified. Does not meet chronic aquatic toxicity classification criteria. 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. Prevent release to the environment, sewers and natural waters.

Ingredient	CAS#	Ecotoxicity Classification Information
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4	No data available
Non-hazardous	Not Available	No data available
Triethylenetetramine	112-24-3	Aquatic Chronic Cat. 3
Benzene-1,3-dimethanamine	1477-55-0	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
Phenol, 2,4,6-tris[(dimethylamino)methyl] reaction products with triethylenetetramine	1101788-77-5	(Reference Triethylenetetramine); Aquatic Chronic Cat. 3
Tris-2, 4, 6-(dimethylaminomethyl) phenol	90-72-2	Acute Aquatic 3; Chronic Aquatic Cat. 3
Aminoethylpiperazine	140-31-8	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
Tetraethylenepentamine	112-57-2	Aquatic Acute Cat. 2; Aquatic Chronic Cat. 2

**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: ..... Not regulated.  
 SHIPPING NAME: ..... Not applicable.  
 TECHNICAL SHIPPING NAME: ..... Not applicable.  
 HAZARD CLASS: ..... Not applicable.  
 PACKING GROUP: ..... Not applicable.  
 MARINE POLLUTANT: ..... Not applicable.

**CANADA TDG**

UN NUMBER: ..... Not regulated.  
 SHIPPING NAME: ..... Not applicable.  
 TECHNICAL SHIPPING NAME: ..... Not applicable.  
 HAZARD CLASS: ..... Not applicable.  
 PACKING GROUP: ..... Not applicable.  
 MARINE POLLUTANT: ..... Not applicable.

**IMDG**

UN NUMBER: ..... Not regulated.  
 SHIPPING NAME: ..... Not applicable.  
 TECHNICAL SHIPPING NAME: ..... Not applicable.  
 HAZARD CLASS: ..... Not applicable.  
 PACKING GROUP: ..... Not applicable.  
 EmS Number: ..... Not applicable.  
 MARINE POLLUTANT ..... Not applicable.

**ICAO/IATA**

UN NUMBER: ..... Not regulated.  
 SHIPPING NAME: ..... Not applicable.  
 TECHNICAL SHIPPING NAME: ..... Not applicable.  
 HAZARD CLASS: ..... Not applicable.  
 PACKING GROUP: ..... Not applicable.  
 MARINE POLLUTANT: ..... Not applicable.

**15. REGULATORY INFORMATION**

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COUNTRY	INVENTORY LIST	STATUS
United States	TSCA	All ingredients are listed or otherwise compliant.
Europe	EINECS or ELINCS	No data available on CAS# 1101788-77-5
Canada	CEPA (DSL/NDSL)	CAS# 1101788-77-5 listed on NDSL only.
Australia	AICS	No data available on CAS# 1101788-77-5
Japan	ENCS	No data available on CAS# 1101788-77-5
South Korea	KECI	No data available on CAS# 1101788-77-5
China	IECSC	No data available on CAS# 1101788-77-5
Philippines	PICCS	No data available on CAS# 1101788-77-5

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

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

**US EPA SARA TITLE 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 hazards 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**

Tris-2, 4, 6-(dimethylaminomethyl) phenol 90-72-2	PA, NJ
Triethylenetetramine 112-14-3	PA, MA, NJ
Tetraethylenepentamine 112-57-2	PA, MA, NJ
Benzene-1,3-dimethanamine 1477-55-0	MA, PA, NJ
Aminoethylepiperazine 140-31-8	MA, PA, NJ

**16. OTHER INFORMATION**

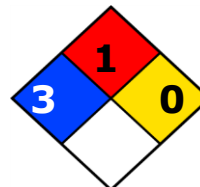
REASON FOR ISSUE:..... Updates to Sections 3, 8, 11 and 15.  
 PREPARED BY:..... Gougeon Brothers, Inc.  
 SDS CONTACT:..... safety@gougeon.com  
 TITLE:..... Health, Safety & Environmental Manager  
 APPROVAL DATE:..... January 15, 2019  
 SUPERSEDES DATE:..... January 16, 2019  
 SDS VERSION:..... 650B-2019a

**OTHER HAZARD INFORMATION AND RATING SYSTEMS:**

**HMIS® RATING**

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

**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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