

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

According to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012 and the Hazardous Products Regulations (HPR) WHMIS 2015

Date of issue: 08/31/2016

Revision date: 10/17/2016

Version: 650B-2016c

### SECTION 1: Identification

#### Identification

**Product form** : Mixtures  
**Product name** : WEST SYSTEM® G/flex® 650 Part B Hardener  
**Product code** : 650B, 650-CH, 650-EH

#### Relevant identified uses of the substance or mixture and uses advised against

**Recommended use** : Curing agent for epoxy resins

#### Details of the supplier of the safety data sheet

##### Manufacturer

Gougeon Brothers, Inc  
100 Patterson Ave.  
Bay City, MI 48706 - U.S.A.  
T 866-937-8797 or 989-684-7286  
[www.westsystem.com](http://www.westsystem.com)

##### Emergency telephone number

**Emergency number** : CHEMTREC 1 (800) 424-9300  
CHEMTREC International +1 (703) 527-3887 24 hr

### SECTION 2: Hazard(s) identification

#### Classification of the substance or mixture

Skin Irrit. 2  
Eye Dam. 1  
Skin Sens. 1

#### Label elements

##### Hazard pictograms (GHS)



GHS05

GHS07

##### Signal word (GHS)

Danger

##### Hazard statements (GHS)

Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction.

##### Precautionary statements (GHS)

Avoid breathing dust, fume, gas, mist, vapours, spray. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves, protective clothing, eye protection, face protection. If on skin: Wash with plenty of soap and water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

##### Other hazards

No additional information available

##### Unknown acute toxicity

Not applicable

### SECTION 3: Composition/information on ingredients

#### Substance

Not applicable

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

According to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012 and the Hazardous Products Regulations (HPR) WHMIS 2015

### Mixtures

Name	Product identifier	%
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	(CAS No) 68683-29-4	30 - 60
Non-hazardous	(CAS No) N/A	10 - 30
Triethylenetetramine	(CAS No) 112-24-3	1 - 10
1,3-Benzenedimethanamine	(CAS No) 1477-55-0	1 - 10
Phenol, 2,4,6-tris[(dimethylamino)methyl]-, reaction products with triethylenetetramine	(CAS No) 1101788-77-5	1 - 5
2,4,6-Tri(dimethylaminomethyl)phenol	(CAS No) 90-72-2	1 - 5
1-Piperazineethanamine	(CAS No) 140-31-8	1 - 5
Tetraethylenepentamine	(CAS No) 112-57-2	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. Refer to Section 15 for additional information regarding this CBI claim.

### SECTION 4: First aid measures

#### Description of first aid measures

- First-aid measures after inhalation** : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.
- First-aid measures after skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.
- First-aid measures after eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. Get medical attention immediately.
- First-aid measures after ingestion** : If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

#### Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation** : May cause respiratory irritation.
- Symptoms/injuries after skin contact** : Causes skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause an allergic skin reaction.
- Symptoms/injuries after eye contact** : Causes serious eye damage. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. May cause burns.
- Symptoms/injuries after ingestion** : May be harmful if swallowed. May cause stomach distress, nausea or vomiting.

#### Indication of any immediate medical attention and special treatment needed

Symptoms may not appear immediately. In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

### SECTION 5: Firefighting measures

#### Extinguishing media

- Suitable extinguishing media** : Foam. Carbon dioxide. Dry chemical.
- Unsuitable extinguishing media** : Do not use a heavy water stream.

#### Special hazards arising from the substance or mixture

- Fire hazard** : Products of combustion may include, and are not limited to: oxides of carbon. Nitrogen oxides. 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.
- Reactivity** : No dangerous reaction known under conditions of normal use.

#### Advice for firefighters

- Protection during firefighting** : Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Use water spray or fog for cooling exposed containers.

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

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### SECTION 6: Accidental release measures

#### Personal precautions, protective equipment and emergency procedures

General measures : Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

#### For non-emergency personnel

No additional information available

#### For emergency responders

No additional information available

#### Environmental precautions

Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

#### Methods and material for containment and cleaning up

**For containment** : Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE). Do not absorb in sawdust, paper, cloth or other combustible absorbents.

**Methods for cleaning up** : Scoop up material and place in a disposal container. Provide ventilation.

#### Reference to other sections

See section 8 for further information on protective clothing and equipment and section 13 for advice on waste disposal.

### SECTION 7: Handling and storage

#### Precautions for safe handling

**Precautions for safe handling** : Do not get in eyes, on skin, or on clothing. Avoid breathing dust, fume, gas, mist, vapours, spray. Do not swallow. Handle and open container with care. When using do not eat, drink or smoke. 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.

**Hygiene measures** : Launder contaminated clothing before reuse. Wash hands before eating, drinking, or smoking. Contaminated work clothing should not be allowed out of the workplace.

#### Conditions for safe storage, including any incompatibilities

**Storage conditions** : Keep out of the reach of children. Keep container tightly closed. Store in a dry, cool and well-ventilated place. Protect from moisture. Storage temperature : 40°F (4°C) - 90°F (32°C).

### SECTION 8: Exposure controls/personal protection

#### Control parameters

<b>2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated (68683-29-4)</b>		
Not applicable		
<b>Non-hazardous (N/A)</b>		
Not applicable		
<b>Triethylenetetramine (112-24-3)</b>		
AIHA	WEEL TWA (mg/m <sup>3</sup> )	6 mg/m <sup>3</sup> (Absorbed via skin)
AIHA	WEEL TWA (ppm)	1 ppm
<b>1,3-Benzenedimethanamine (1477-55-0)</b>		
ACGIH	ACGIH Ceiling (mg/m <sup>3</sup> )	0.1 mg/m <sup>3</sup>
NIOSH	NIOSH REL (ceiling) (mg/m <sup>3</sup> )	0.1 mg/m <sup>3</sup>
<b>Phenol, 2,4,6-tris[(dimethylamino)methyl]-, reaction products with triethylenetetramine (1101788-77-5)</b>		
AIHA	WEEL TWA (mg/m <sup>3</sup> )	6 mg/m <sup>3</sup>
AIHA	WEEL TWA (ppm)	1 ppm
<b>2,4,6-Tri(dimethylaminomethyl)phenol (90-72-2)</b>		
Not applicable		
<b>1-Piperazineethanamine (140-31-8)</b>		
Not applicable		

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

According to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012 and the Hazardous Products Regulations (HPR) WHMIS 2015

Tetraethylenepentamine (112-57-2)		
AIHA	WEEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup>
AIHA	WEEL TWA (ppm)	1 ppm

### Exposure controls

- Appropriate engineering controls** : Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.
- Hand protection** : Wear chemically resistant protective gloves.
- Eye protection** : Wear approved eye protection (properly fitted dust- or splash-proof chemical safety goggles) and face protection (face shield).
- Skin and body protection** : Wear suitable protective clothing.
- Respiratory protection** : In case of insufficient ventilation, wear suitable respiratory equipment. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Environmental exposure controls** : Maintain levels below Community environmental protection thresholds.
- Other information** : Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Handle according to established industrial hygiene and safety practices.

## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

- Physical state** : Liquid
- Appearance** : Viscous liquid
- Colour** : Caramel
- Odour** : Amine-like
- Odour threshold** : No data available
- pH** : 10.96
- Melting point** : No data available
- Freezing point** : No data available
- Boiling point** : No data available
- Flash point** : > 300 °F (149°C) (estimated based similar product)
- Relative evaporation rate (butylacetate=1)** : No data available
- Flammability (solid, gas)** : Not flammable
- Vapour pressure** : No data available
- Relative vapour density at 20 °C** : No data available
- Relative density** : 0.97
- Solubility** : No data available
- Partition coefficient n-octanol/water** : No data available
- Auto-ignition temperature** : No data available
- Decomposition temperature** : No data available
- Viscosity, kinematic** : 19.587 mm<sup>2</sup>/s
- Viscosity, dynamic** : No data available
- Explosive limits** : No data available
- Explosive properties** : No data available
- Oxidising properties** : No data available
- Other information**
- VOC content** : 8.6 g/l (0.07 lbs/gal)
- Bulk density** : 8.08 lb/gal (0.97 kg/L)

## SECTION 10: Stability and reactivity

- Reactivity** : No dangerous reaction known under conditions of normal use.
- Chemical stability** : Stable under normal storage conditions.

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

According to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012 and the Hazardous Products Regulations (HPR) WHMIS 2015

<b>Possibility of hazardous reactions</b>	: No dangerous reaction known under conditions of normal use. A mass of more than one pound of product plus an epoxy resin will cause irreversible polymerization with significant heat buildup and pressure.
<b>Conditions to avoid</b>	: Heat. Incompatible materials.
<b>Incompatible materials</b>	: Acids. Oxidizing materials. Halogenated compounds.
<b>Hazardous decomposition products</b>	: May include, and are not limited to: oxides of carbon. Nitrogen oxides. Amines. Ammonia. Nitric acid. Nitrosamines.

### SECTION 11: Toxicological information

#### Information on toxicological effects

<b>2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated (68683-29-4)</b>	
LD50 oral rat	> 15400 mg/kg
LD50 dermal rabbit	> 3000 mg/kg

<b>Triethylenetetramine (112-24-3)</b>	
LD50 oral rat	1716 mg/kg
LD50 dermal rabbit	1465 mg/kg

<b>1,3-Benzenedimethanamine (1477-55-0)</b>	
LD50 oral rat	980 mg/kg
LD50 dermal rabbit	2000 mg/kg
LC50 inhalation rat	1.34 mg/l/4h

<b>Phenol, 2,4,6-tris[(dimethylamino)methyl]-, reaction products with triethylenetetramine (1101788-77-5)</b>	
LD50 oral rat	1716 mg/kg
LD50 dermal rabbit	1465 mg/kg

<b>2,4,6-Tri(dimethylaminomethyl)phenol (90-72-2)</b>	
LD50 oral rat	2169 mg/kg

<b>1-Piperazineethanamine (140-31-8)</b>	
LD50 oral rat	2097 mg/kg
LD50 dermal rabbit	866 mg/kg

<b>Tetraethylenepentamine (112-57-2)</b>	
LD50 oral rat	2140 - 3990 mg/kg
LD50 dermal rabbit	630 mg/kg

<b>Acute toxicity (oral)</b>	: Not classified.
<b>Acute toxicity (dermal)</b>	: Not classified.
<b>Acute toxicity (inhalation)</b>	: Not classified.
<b>Skin corrosion/irritation</b>	: Causes skin irritation.
<b>Serious eye damage/irritation</b>	: Causes serious eye damage.
<b>Respiratory or skin sensitization</b>	: May cause an allergic skin reaction.
<b>Germ cell mutagenicity</b>	: Not classified.
<b>Carcinogenicity</b>	: Not classified.
<b>Reproductive toxicity</b>	: Not classified.
<b>STOT-single exposure</b>	: Not classified.
<b>STOT-repeated exposure</b>	: Not classified.
<b>Aspiration hazard</b>	: Not classified.

<b>WEST SYSTEM® G/flex® 650 Part B Hardener</b>	
Viscosity, kinematic (calculated value) (40 °C)	19.587 mm <sup>2</sup> /s

<b>Symptoms/injuries after inhalation</b>	: May cause respiratory irritation.
<b>Symptoms/injuries after skin contact</b>	: Causes skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause an allergic skin reaction.
<b>Symptoms/injuries after eye contact</b>	: Causes serious eye damage. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. May cause burns.

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

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<b>Symptoms/injuries after ingestion</b>	: May be harmful if swallowed. May cause stomach distress, nausea or vomiting.
<b>Other information</b>	: Likely routes of exposure: ingestion, inhalation, skin and eye.

### SECTION 12: Ecological information

#### Toxicity

**Ecology - general** : May cause long-term adverse effects in the aquatic environment.

Triethylenetetramine (112-24-3)	
LC50 fish 1	570 mg/l (Exposure time: 96 h - Species: Poecilia reticulata [semi-static])
EC50 Daphnia 1	31.1 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	495 mg/l (Exposure time: 96 h - Species: Pimephales promelas)

1-Piperazineethanamine (140-31-8)	
LC50 fish 1	1950 - 2460 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	32 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	> 1000 mg/l (Exposure time: 96 h - Species: Poecilia reticulata [semi-static])

Tetraethylenepentamine (112-57-2)	
LC50 fish 1	420 mg/l (Exposure time: 96 h - Species: Poecilia reticulata [static])
EC50 Daphnia 1	24.1 mg/l (Exposure time: 48 h - Species: Daphnia magna)

#### Persistence and degradability

WEST SYSTEM® G/flex® 650 Part B Hardener	
Persistence and degradability	Not established.

#### Bioaccumulative potential

WEST SYSTEM® G/flex® 650 Part B Hardener	
Bioaccumulative potential	Not established.

Triethylenetetramine (112-24-3)	
BCF fish 1	(no bioaccumulation expected)
Partition coefficient n-octanol/water	-1.4

1-Piperazineethanamine (140-31-8)	
BCF fish 1	(no bioaccumulation expected)
Partition coefficient n-octanol/water	-1.48

Tetraethylenepentamine (112-57-2)	
BCF fish 1	(no bioaccumulation expected)
Partition coefficient n-octanol/water	< 1

#### Mobility in soil

WEST SYSTEM® G/flex® 650 Part B Hardener	
Ecology - soil	No additional information available.

#### Other adverse effects

**Effect on the global warming** : No known effects from this product.

Name	Product identifier	Ecotoxicity Classification Information
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	(CAS No) 68683-29-4	No data available
Non-hazardous	(CAS No) N/A	No data available
Triethylenetetramine	(CAS No) 112-24-3	Aquatic Chronic Cat. 3
1,3-Benzenedimethanamine	(CAS No) 1477-55-0	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
Phenol, 2,4,6-tris[(dimethylamino)methyl]-, reaction products with triethylenetetramine	(CAS No) 1101788-77-5	Aquatic Chronic Cat. 3
2,4,6-Tri(dimethylaminomethyl)phenol	(CAS No) 90-72-2	Acute Aquatic 3; Chronic Aquatic Cat. 3
1-Piperazineethanamine	(CAS No) 140-31-8	Acute Aquatic Cat. 3; Chronic Aquatic Cat. 3
Tetraethylenepentamine	(CAS No) 112-57-2	Aquatic Acute Cat. 2; Aquatic Chronic Cat. 2

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

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### SECTION 13: Disposal considerations

#### Waste treatment methods

**Product/Packaging disposal recommendations** : This material must be disposed of in accordance with all local, state, provincial, and federal regulations. The generation of waste should be avoided or minimized wherever possible.

### SECTION 14: Transport information

#### Department of Transportation (DOT) and Transportation of Dangerous Goods (TDG)

In accordance with DOT and TDG

Not regulated

#### Transport by sea

In accordance with IMDG

Not regulated

#### Transport by sea

In accordance with IATA

Not regulated

### SECTION 15: Regulatory information

#### Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory except for:

All components of this product are listed, or excluded from listing, on the Canadian DSL (Domestic Substances List) and NDSL (Non-Domestic Substances List) inventories except for:

<b>2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated (68683-29-4)</b>	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e, Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C)).

<b>Phenol, 2,4,6-tris[(dimethylamino)methyl]-, reaction products with triethylenetetramine (1101788-77-5)</b>	
EPA TSCA Regulatory Flag	P - P - indicates a commenced PMN substance.

Canada WHMIS Confidential Business Information (CBI): The HMIRA number issued for this CBI claim is #10443. The date of filing is 2016-10-13

#### International regulations

No additional information available

#### US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

<b>Triethylenetetramine (112-24-3)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

<b>1,3-Benzenedimethanamine (1477-55-0)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

<b>1-Piperazineethanamine (140-31-8)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

<b>Tetraethylenepentamine (112-57-2)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

### SECTION 16: Other information

**Date of issue** : 08/31/2016

**Revision date** : 01/16/2017

# WEST SYSTEM® G/flex® 650 Part B Hardener

## Safety Data Sheet

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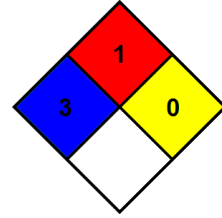
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**Other information** : None.

**NFPA health hazard** : 3

**NFPA fire hazard** : 1

**NFPA reactivity** : 0



HMIS III Rating

**Health** : 3 Serious Hazard

**Flammability** : 1 Slight Hazard

**Physical** : 0 Minimal Hazard

*Disclaimer: We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.*