SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:.....WEST SYSTEM® 702 and 703 Episize™ Unidirectional Carbon Tapes
APPLICABLE PRODUCT CODES: .....702, 702-12, 702-50, 703, 703-12 and 703-50
CHEMICAL FAMILY:.....Woven carbon fabric with sized carbon fibers
INTENDED PRODUCT USES:.....Composite fiber reinforcement applications
PRODUCT RESTRICTIONS:.....None identified.
SDS VERSION: 702/703-2015a

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 3
Skin sensitizer, Category 1

Label Elements

Hazard Pictogram(s):

Signal Word
WARNING

Hazard Statements
H316 Causes mild skin irritation.
H317 May cause an allergic skin reaction.

Precautionary Statements
Prevention
P261 Avoid breathing dust/fume/gas/mist/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.
Response
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P333 + P313 If skin irritation or rash occurs: Get medical attention/advice.
P362 + P364 Take off contaminated clothing and wash it before re-use.
Disposal
P501 Dispose of contents/container in accordance with local, regional and international regulations.

Other Hazards Not Resulting In Classification
None known.

3. COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

INGREDIENT NAME	CAS #	CONCENTRATION (%)
Graphite (carbon) continuous synthetic fibers, filament diameter >4um	7440-44-0	98-100
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25086-38-6	0.1-2

The exact chemical identity and/or exact percentage (concentration) of each ingredient has been held as a trade secret.

4. FIRST AID MEASURES

FIRST AID FOR EYES..... SYMPTOMS: Exposure to airborne fragments may cause mechanical irritation and tearing. RESPONSE: Flush with water for at least 15 minutes. Remove contact lenses if present and easy to do. Consult a physician as a precautionary measure if symptoms develop and persist.

FIRST AID FOR SKIN..... SYMPTOMS: May cause slight mechanical irritation and itchy feeling due to the carbon fiber abrading or becoming embedded in the skin. May cause an allergic skin reaction. RESPONSE: Wash with mild soap and water. Consult a physician if effects occur and persist.

FIRST AID FOR INHALATION..... SYMPTOMS: Excessive exposure to airborne fibers may cause coughing, respiratory irritation. RESPONSE: Remove to fresh air if symptoms develop and keep comfortable for breathing. Seek medical advice is symptoms persist.

FIRST AID FOR INGESTION..... SYMPTOMS: No acute adverse health effects expected from amounts ingested under normal conditions of use. RESPONSE: Seek medical attention if a significant amount is ingested.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: ..... SUITABLE: Foam, carbon dioxide (CO_2), water, or dry chemical. Fog or mist is recommended if water is used. NON-SUITABLE: Avoid using high pressure media.

FIRE AND EXPLOSION HAZARDS: ..... The carbon fiber is not expected to burn. Components of the product, e.g. the sizing, may burn off the fiber in the presence of a fire. When exposed to temperatures > 120°C and during combustion, the following degradation products may be generated but not limited to: ammonia, hydrogen cyanide, oxides of nitrogen, oxides of carbon, monomeric acrylonitrile, organic compounds and other potentially harmful and toxic substances.

SPECIAL FIRE FIGHTING PROCEDURES: ..... Wear a self-contained breathing apparatus and complete full-body personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND PROTECTIVE EQUIPMENT: ..... 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:..... Use methods that avoid generating airborne dust. Use of a vacuum with high efficiency particulate air (HEPA) filtration is recommended. Do not create a dust cloud by brushing or sweeping, or using compressed air.

ENVIRONMENTAL PRECAUTIONS:..... Contain spilled product to the extent practical and feasible. Prevent from entering drains or other discharge to surface waters.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE (min./max.): ..... 0°F (-17°C) / 100°F (38°C)

STORAGE:..... Store in cool, dry place. Store in sealed containers to prevent moisture absorption or absorption of other volatile materials. Keep away from sources of ignition.

HANDLING PRECAUTIONS: ..... Avoid excessive dust formation. Avoid breathing dust. Wash after handling. Provide appropriate exhaust ventilation at points of operation where dust can be generated. Avoid using compressed air. Dust deposits should not be allowed to accumulate on surfaces. Carbon fibers may be electrically conductive and could result in damage to or malfunctioning of electrical equipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION GUIDELINES: ..... Safety glasses with side shields, or goggles if necessary.

SKIN PROTECTION GUIDELINES:..... Gloves or a barrier cream may be useful to help prevent mechanical irritation. Lightweight protective suits may help prevent skin contact and subsequent mechanical skin irritation. Discard or launder any clothing that you feel has been contaminated.

RESPIRATORY/VENTILATION GUIDELINES:..... Use with adequate general ventilation and/or local ventilation to keep exposures below established limits. When ventilation cannot be made adequate enough to keep exposures below established limits, use a NIOSH approved respirator with particulate filter, such as a N95 or greater, 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 to the guidelines established in OSHA 1910.134 or other applicable respiratory protection standard.

ADDITIONAL PROTECTIVE MEASURES:..... Practice good caution and personal cleanliness to avoid skin and eye contact. Wash thoroughly after handling. Generally speaking, working cleanly and following basic precautionary measures will greatly minimize the 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
Graphite (carbon) continuous synthetic fibers, filament diameter >4um	7440-44-0	**Limits are applicable when material is available as a nuisance dust.** ACGIH 10mg/m^3,

		TWA, Inhalable; 3 mg/m^3, TWA, Respirable; OSHA PEL 15 mg/m^3, TWA, total dust; 5 mg/m^3, TWA, Respirable
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25086-38-6	No data available

NOTE: OSHA and ACGIH have not established air contaminant limits for continuous synthetic carbon fibers. Under certain handling conditions, this material may become a nuisance dust. OSHA has an established standard for particulates not otherwise regulated (nuisance dusts) set at 15 mg/m^3 for total dust and 5 mg/m^3 respirable fraction. ACGIH has established an exposure limit of 10mg/m^3 for the inhalable fraction and 3 mg/m^3 for the respirable fraction.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM: ..... Solid, fiber.
COLOR: ..... Black.
ODOR:..... None.
ODOR THRESHOLD: ..... No data available
pH..... No data available
MELTING POINT / FREEZING POINT ..... Melting Point – 6512°F (3600°C)
BOILING POINT (760mm/Hg): ..... No data available
FLASH POINT:..... No data available
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)..... 1.75 – 1.85
BULK DENSITY..... No data available
VAPOR DENSITY (air = 1) ..... No data available
EVAPORATIOIN RATE (Butyl Acetate = 1)..... No data available
WATER SOLUBILITY (% BY WT.) ..... Insoluble
PARTITION COEFFICIENT, n-OCTANOL/WATER (log Pow)..... No data available
KINEMATIC VISCOSITY: ..... No data (mm^2/s @ 20°C)
DECOMPOSITION TEMPERATURE: ..... No data available.
% VOLATILE BY WEIGHT: ..... Not applicable.
EXPLOSIVE PROPERTIES:..... No data available.
Kst VALUE:..... No data available
MAXIMUM EXPLOSION PRESSURE (Pmax) ..... No data available
MINIMUM IGNITION ENERGY (MIE):..... No data available
MAXIMUM EXPLOSION CONCENTRATION (MEC): ..... No data available
DUST EXPLOSION CLASSIFICATION: ..... No data available

10. STABILITY AND REACTIVITY

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

REACTIVITY/HAZARDOUS REACTIONS:..... Product will not react by itself.

INCOMPATIBILITIES: ..... Strong oxidizing agents.

CONDITIONS TO AVOID: ..... Avoid dust collection and airborne dust formation. Sizing on the fiber will degrade upon exposure to acids or bases.

DECOMPOSITION PRODUCTS:..... When exposed to temperatures > 120°C and during combustion, the following degradation products may be generated but not limited to: ammonia, hydrogen cyanide, oxides of nitrogen, oxides of carbon, monomeric acrylonitrile, organic compounds and other potentially harmful and toxic substances.

11. TOXICOLOGICAL AND HAZARD ENDPOINT INFORMATION

Component Name	CAS#	LD_{50} Oral	LD_{50} Dermal	LC_{50} Inhalation
Graphite (carbon) continuous synthetic fibers, filament diameter >4um	7440-44-0	No data	No data	No data
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25086-38-6	>15,000 mg/kg (rat)	>23,000 mg/kg (rabbit)	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 the product does not meet acute oral toxicity criteria.
Dermal: ..... Not classified. Based on available data the product does not meet acute dermal toxicity criteria.
Inhalation:..... Not classified. Based on available data the product does not meet acute inhalation toxicity criteria.

SKIN CORROSION / IRRITATION:..... Category 3. Causes mild skin irritation. Handling the product may cause mechanical skin irritation.

SERIOUS EYE DAMAGE / IRRITATION:..... Not classified. Based on available data the product does not meet serious eye damage/irritation criteria. Handling the product may cause mechanical eye irritation.

RESPIRATORY SENSITIZATION:..... Not classified. Based on available data the product does not meet respiratory sensitization criteria.

SKIN SENSITIZATION:..... Category 1. May cause allergic skin reaction. The epoxy resin component of this product can cause allergic contact dermatitis and skin sensitization.

REPRODUCTIVE TOXICITY:..... Not classified. Based on available data the product does not meet reproductive toxicity criteria. Diglycidyl ether bisphenol-A, in animal studies, has been shown not to interfere with reproduction. Diglycidyl ether bisphenol-A did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally.

Phenyl glycidyl ether, an impurity in this product at levels < 6ppm, has shown effects on fertility based on inhalation studies on rats.

MUTAGENICITY:..... Not classified. Based on available data the product does not meet mutagenicity criteria. Diglycidyl ether bisphenol-A in animal mutagenicity studies were negative. In vitro mutagenicity tests were negative in some cases and positive in others.

Several *in vitro* mutagenicity tests have been performed on carbon fibers. Carbon fibers have been found to be negative in the gene mutation assay in bacteria (Ames test), did not cause sister chromatid exchanges in Chinese hamster ovary (CHO) cells, and did not cause unscheduled DNA synthesis in rat liver cells or forward mutations in studies with CHO cells.

Phenyl glycidyl ether, an impurity in this product at levels < 6ppm, has shown mutagenic effects in *in vitro* tests. Tests involving hamster embryo have shown morphological transformations. Tests on hamsters have shown sister chromatid exchange affecting the lungs.

CARCINOGENICITY:..... Not classified. Based on available data the product does not meet carcinogenicity criteria. No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA, NTP or IARC.

Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol-A. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that Diglycidyl ether bisphenol-A is carcinogenic. Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that Diglycidyl ether bisphenol-A is not classified as a carcinogen.

Epichlorohydrin, an impurity in this product at levels <2 ppm has been reported to produce cancer in laboratory animals and to produce mutagenic changes in bacteria and cultured human cells. It has been established by the International Agency for Research on Cancer (IARC) as a probable human carcinogen (Group 2A) based on the following conclusions: human evidence – inadequate; animal evidence – sufficient. It has been classified as an anticipated human carcinogen by the National Toxicology Program (NTP). Note: It is unlikely that normal use of this product would result in measurable exposure concentrations to this substance.

Phenyl glycidyl ether, an impurity in this product at levels < 6ppm, is classified by IARC as possibly carcinogenic to humans (Group 2B). ACGIH classifies phenyl glycidyl ether as a confirmed animal carcinogen with unknown relevance to humans, A3. Inhalation studies on rats reported by RTECS indicates tumorigenic effects on olfactory sense organs. Phenyl glycidyl ether is not classified as a known or anticipated carcinogen by NTP and is not identified as a carcinogen or possible carcinogen by OSHA.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):..... Not classified. Based on available data the product does not meet STOT SE criteria.

SPECIFIC TARGET ORGAN TOXICITY (Repeated Exposure): ..... Not classified. Based on available data the product does not meet STOT RE criteria.

ASPIRATION HAZARD: ..... Not classified. Based on available data the product does not meet aspiration toxicity criteria.

OTHER HEALTH HAZARD INFORMATION:..... Handling the product may result in mechanical skin and eye irritation.
SUB-CHRONIC TOXICITY:..... Two sub-chronic inhalation tests in rats exposed to carbon fibers have been conducted. In one test, rats were exposed to carbon fibers for 16 weeks. Pulmonary function tests performed on the test animals before necropsy did not show any significant or consistent changes. The only pulmonary finding related to exposure was the occurrence of phagocytosis by alveolar macrophages. No inflammation or fibrosis was observed. In the second study, rats were also exposed to carbon fibers for 16 weeks. Based on clinical signs, no effects due to exposure were observed. Histopathological evaluation revealed non-fibrous particles in the pulmonary lymphoid clearance system and in alveolar macrophages. There were no signs of fibrosis.

12. ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:..... No specific test data available for the product. Calculated Estimate: Does not meet acute aquatic toxicity criteria.

CHRONIC AQUATIC TOXICITY: ..... No specific test data available for the product. Calculated Estimate: Does not meet chronic aquatic toxicity criteria.

PERSISTANCE AND BIODEGRADABILITY: ..... No specific test data available for the product.

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

ADDITIONAL ECOTOXICITY INFORMATION:..... Prevent release to the environment, sewers and natural waters.

Ingredient	CAS#	Ecotoxicity Classification Information
Graphite (carbon) continuous synthetic fibers, filament diameter >4um	7440-44-0	Not classified.
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25086-38-6	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.

Recycle or reclaim may be preferred methods when conducted in accordance with federal, state and local regulations. Do not incinerate carbon fibers since they are electrically conductive and the airborne fibers may cause electrical malfunctions.

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.

CANADA TDG
UN NUMBER: ..... Not regulated.
SHIPPING NAME:..... Not applicable.
TECHNICAL SHIPPING NAME:..... Not applicable.
HAZARD CLASS:..... Not applicable.
PACKING GROUP:..... 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.

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.

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.
New Zealand	NZIoC	All ingredients are listed or otherwise compliant.

INTERNATIONAL REGULATIONS:
This product contains a branched nonylphenol ethoxlate sulfated ammonium salt (CAS# 68649-55-8) which may be present at levels in excess of 0.1%. Canada and the EU have restrictions on the use and marketing of products that contain nonylphenol and nonylphenol ethoxylates in excess

of 0.1% in several specified product use sectors. Refer to the EU Directive2003/53/EC and the Canada Gazette Vol. 138, No. 49, for the specific use and threshold restrictions relative to each use sector.

US EPA SARA TITLE III Reporting and Notification Requirements:

Subject to Section 302 (TPQ) ..... Not regulated.
Subject to Section 304 (RQ)..... Not regulated.
Subject to Section 311 or 312 ..... Not regulated.
Subject to Section 313 ..... Not regulated.

STATE REGULATORY INFORMATION:

Chemicals listed below 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
Phenyl glycidyl ether 122-60-1	< 6ppm	[1]CA
Epichlorohydrin 106-89-8	< 2ppm	[1]CA

[1.] These substances are known to the state of California to cause cancer or reproductive harm, or both.

16. OTHER INFORMATION

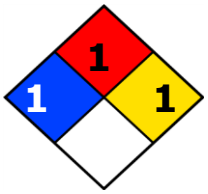
REASON FOR ISSUE:..... Compliant to the requirements of the US OSHA 1910.1200 HazCom 2012 standard.
PREPARED BY:..... G. M. House
APPROVED BY:..... G. M. House
SDS CONTACT:..... safety@gougeon.com
TITLE: ..... Health, Safety & Environmental Manager
APPROVAL DATE: ..... June 1, 2015
SUPERSEDES DATE:..... February 6, 2011
SDS VERSION: ..... 702 and 703-2015a

OTHER HAZARD INFORMATION AND RATING SYSTEMS:

HMIS® RATING

HEALTH:	1
FLAMMABILITY:	1
PHYSICAL HAZARD:	1
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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