



HJ3 Composite Technologies, LLC
 4100 S. Fremont Ave.
 Tucson, AZ 85714
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HJ3 Glass Fiber Composite (GL-510)

Description

The HJ3 Glass Composite is a pre-cured s-glass plate designed for strengthening flat surfaces such as steel girders, wood girders, and concrete and masonry walls. HJ3 L-Series carbon laminates are bonded to substrates with the HJ3 Tack Coat Epoxies (TC-300, TC-310).

TYPICAL DATA FOR HJ3 Glass Fiber Composite	
STORAGE CONDITIONS	Store dry at 40°F-95°F
COLOR	White

Suggested Uses

- Flexural strengthening of concrete, steel and wood beams
- Increase flexural and shear forces of concrete and masonry walls

Advantages

- Corrosion resistant – minimizing costs and wear
- Adds only a 1/16th of an inch to the repaired surface
- Light weight (½ the weight of aluminum)
- Reduces installation time since heavy equipment and welding is eliminated
- Low thermal expansion
- Minimal change to structure's shape, weight and appearance
- Used for increasing strength, stiffness, fatigue resistance of damaged structure up to and at times beyond its initial design value
- Minimal disruption and noise
- Economical

PHYSICAL STRENGTHS	TYPICAL VALUES	DESIGN VALUES	ASTM TEST METHOD
Tensile Strength (ksi)	129.8	118.6	D3039
Modulus of Elasticity (ksi)	5,112	4,464	D3039
Effective Ply Thickness (in.)	.047		

Shipping

*Shipped FOB Tucson, AZ or through authorized distributors.

Surface Preparation

The preparation of surfaces to receive the HJ3 Carbon Fiber Composite must be given careful attention, as **the bonding capability of the epoxy for a given application is primarily dependent on proper surface preparation.** Concrete surfaces must be structurally sound and free from contaminants such as dust, oil or dirt. Surfaces must be shot blasted or mechanically abraded to achieve a minimum 3-mil profile. Remove fins, sharp edges, and protrusions that may trap air behind the installed wrap. Coated surfaces must be mechanically cleaned and abraded to the equivalent of 60 - 80 mesh. Repair all damaged concrete, spills and irregular surfaces and fill uneven surfaces with HJ3 putty mix (PM-100).

Mixing Epoxy

Thorough and complete mixing is critical. **WARNING: Epoxies develop heat during mixing and curing.** To keep temperature rise to a minimum, a high surface area to volume ratio during mixing is recommended. For manual mixing, each mix volume should be kept to 5 gallons or less. For automated mixing follow the equipment manufacturer's instruction.

First, mix each component separately. Proportion each component at their specified ratio and mix using a slow-speed drill with jiffy paddle at 400-600 RPM for 3-5 minutes until a consistent gray color is achieved. No stripes, streaks, or color variation should be visible. Use an up and down motion, scraping the mixing container sides and bottom. **Mix no more material than may be applied within the specified pot life of the epoxy.**

Application of Laminate Strips

STEP 1: Using a roller or sprayer, apply 5 to 10 mils of (HJ3's PC-100 onto the prepared surface. **STEP 2:** Apply 60 to 80 mils of HJ3's Tack Coat Epoxy wet to the primed surface. Due to the porosity of substrate, application rate may vary. **STEP 3:** Apply the laminate strip and press to assure a good bond and to remove any entrapped air. **STEP 4:** Apply paint or coating as needed.

When multi-layer strips are used, each individual layer shall be firmly bedded and adhered to the preceding layer. Always place the sanded surface of the laminate in contact with the epoxy. Therefore, in multiplayer applications or when coating and painting is desired, use laminates with both sides sanded.



Step 1: Prepare Surface



Step 2: Mix & Apply StrongHold™ Resin Wall and Carbon Strap



Step 3: Place StrongHold™ Carbon Strap to Wall



Step 4: Apply Paint

Curing of Strips

Curing times and temperature for strip shall be maintained for the designated formulation used, according to the instructions supplied with the HJ3 adhesive.

Procedure Modifications

Due to environmental factors affecting quality of work, installation procedures may be modified to achieve maximum results. Procedure modifications shall be discussed with and approved by the Engineer of record prior to implementing the modifications.

Conditions to Avoid

- Do not apply to concrete with temperature outside of application temperature range
- Do not apply to concrete less than 30 days old
- Do not apply to concrete with curing or sealing membranes
- Do not apply to base concrete at a temperature less than 45 °F

**MATERIAL DATA SAFETY SHEET (MSDS)
for HJ3 Glass Fiber Composite (GL-510)**

REV DATE: 1 Jan 2008
REVISION: 2

Section 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **GL-510**
SYNONYMS: All product grades
CHEMICAL FAMILY: Fibrous Glass
MFR'S NAME: HJ3 Composite Technologies, LLC, 4100 S. Fremont Ave., Tucson, AZ 85714
EMERGENCY PHONE: 800/535-5053 (Infotrac) GENERAL INFORMATION: 877/303-0453 (HJ3)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

Component	Chemical Name	CAS No.	Wt. %
Fiber Glass Continuous Filament (non respirable)	Fibrous Glass	65997-17-3	94-100
Sizing	Sizing	None	0-2
Polyester Yarn	Polyester Yarn	None	0-4

Note: See Section 8 of MSDS for exposure limit data for these ingredients.

Section 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: No unusual emergency conditions are expected from this product.

APPEARANCE AND ODOR: White/off-white colored solid with no odor.

PRIMARY ROUTE(S) OF EXPOSURE: Inhalation, skin, eye

POTENTIAL HEALTH EFFECTS:

- Acute (short term): Fiberglass continuous filament is a mechanical irritant. Breathing dusts and fibers may cause short-term irritation of the mouth, nose, and throat. Skin contact with dust and fibers may cause itching and short-term irritation. Eye contact with dust and fibers may cause short-term mechanical irritation. Ingestion may cause short-term mechanical irritation of the stomach and intestines. See Section 8 for exposure controls.
- Chronic (long term): There is no known health effects connected with long term use or contact with this product. See Section 11 of MSDS for more toxicological data.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Those with long term breathing or skin conditions that are aggravated by mechanical irritants may be at a higher risk for worsening from use or contact with this product.

Section 4: FIRST AID MEASURES

EYE:

- In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Seek medical attention if irritation persists.

SKIN:

- Wash with mild soap and running water. Use a washcloth to help remove fibers. To avoid more irritation, do not rub or scratch affected areas. Rubbing or scratching may force fibers into skin. Seek medical attention if irritation persists.

INGESTION:

- Ingestion of this material is unlikely. If it does occur, seek immediate medical attention.

INHALATION:

- Move person to fresh air. Seek medical attention if irritation persists.

Section 5: FIRE FIGHTING MEASURES

FLASH POINT: None.

FLAMMABLE LIMITS (% BY VOL): None.

AUTOIGNITION TEMP: Not applicable.

EXTINGUISHING MEDIA: Water, foam, CO₂ or dry chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS: None Known.

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FIRE FIGHTING INSTRUCTIONS: Use self-contained breathing apparatus (SCBA) in a sustained fire.

HAZARDOUS COMBUSTION PRODUCTS: Primary combustion products are carbon monoxide, carbon dioxide and water. Other undetermined compounds could be released in small quantities.

Section 6: ACCIDENTAL RELEASE MEASURES

LAND SPILL: Scoop up material and put into suitable container for disposal as a non-hazardous waste.

WATER SPILL: This material will sink and disperse along the bottom of waterways and ponds. It can not easily be removed after it is waterborne; however, the material is non-hazardous in water.

AIR RELEASE: This material will settle out of the air. If concentrated on land it can then be scooped up for disposal as a non-hazardous waste.

Section 7: HANDLING AND STORAGE

STORAGE TEMPERATURE: Not applicable.

STORAGE PRESSURE: Not applicable.

GENERAL: No special storage or handling procedures are required for this material.

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

Ingredient	OSHA PEL (8-hr TWA)	ACGIH TLV (8-hr TWA)
Fiber Glass Continuous Filament	5 mg/m ³ (respirable dust) 15 mg/ m ³ (total dust) 1 fiber/cc (proposed)	10 mg/ m ³ (inhalable) 3 mg/ m ³ (respirable)
Sizing	None Established	None Established
Polyester Yarn	5 mg/ m ³ (respirable dust) 15 mg/ m ³ (total dust)	10 mg/ m ³ (inhalable) 3 mg/ m ³ (respirable)

VENTILATION: General dilution ventilation and or/local exhaust ventilation should be provided as necessary to maintain exposures below regulatory limits.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: A properly fitted NIOSH/MSHA approved disposable dust respirator such as the 3M model 8210 (or 8710) or model 9900 (in high humidity environments) or equivalent should be used when: high dust levels are encountered; the level of glass fibers in the air exceeds the OSHA permissible limits; or if irritation occurs. Use respiratory protection program, local regulations and OSHA regulations under 29 CFR 1910.134.

SKIN PROTECTION: Loose fitting long sleeved shirt that covers to the base of the neck, long pants and gloves. Skin irritation is known to occur chiefly at pressure points such as around neck, wrist, and between fingers.

EYE PROTECTION: Safety glasses or goggles.

WORK AND HYGIENIC PRACTICES: Handle using good industrial hygiene and safety practices. Avoid unnecessary contact with dusts and fibers by using good local exhaust ventilation. Remove material from the skin and eyes after contact. Remove material from clothing using vacuum equipment (never use compressed air and always wash work clothes separately from other clothing. Wipe out the washer or sink to prevent loose glass fibers from getting on other clothing). Keep the work area clean of dusts and fibers (avoid sweeping or using compressed air as these techniques re-suspend dusts and fibers into the air). Have access to safety showers and eye wash stations.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

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APPEARANCE: White/off-white
 PHYSICAL STATE: Solid
 ODOR: None
 VAPOR PRESS: Not applicable
 VAPOR DENSITY: Not applicable
 BOILING PT: Not applicable
 SPECIFIC GRAVITY: 2.60
 SOLUBILITY IN H₂O: Insoluble
 EVAPORATION RATE: Not applicable
 VISCOSITY: Not applicable
 % VOLATILE (BY WT): Not applicable
 pH: Not applicable

Section 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.
 INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID: None known.
 HAZARDOUS POLYMERIZATION: Will not occur.
 HAZARDOUS DECOMPOSITION: Sizings or bindings may decompose in a fire. See Section 5 of MSDS for combustion products statement.

Section 11: TOXICOLOGICAL INFORMATION

CARCINOGENICITY: The table below indicates whether or not each agency has listed each ingredient as a carcinogen:

Ingredient	ACGIH	IARC	NTP	OSHA
Fiber Glass Continuous Filament	A4	3	No	No
Sizing	No	No	No	No
Polyester Yarn	No	No	No	No
	LD ₅₀ Oral (g/kg)	LD ₅₀ Dermal (g/kg)	LC ₅₀ Inhalation (ppm, 8 hrs.)	
Fiber Glass Continuous Filament	Not Available	Not Available	Not Available	
Sizing	Not Available	Not Available	Not Available	
Polyester Yarn	Not Available	Not Available	Not Available	

FIBER GLASS CONTINUOUS FILAMENT: The International Agency for Research on Cancer (IARC) in June, 1987, categorized fiber glass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC as insufficient to classify fiberglass continuous filament as a possible, probable, or confirmed cancer causing material.

Section 12: ECOLOGICAL INFORMATION

This material is not expected to cause harm to animals, plants, or fish.

Section 13: DISPOSAL CONSIDERATIONS

RCRA HAZARD CLASS: Non-hazardous

Section 14: TRANSPORT INFORMATION (U.S. & Canada)

DOT SHIPPING NAMES: Not regulated
 HAZARD CLASS OF DIVISION: None
 IDENTIFICATION NO.: None
 LABEL(S) REQUIRED (if not accepted): None
 SPECIAL PROVISIONS: None
 NON-BULK PACKAGING: None

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EPA HAZARDOUS SUBSTANCES: None
 QUANTITY LIMITATIONS: None
 MARINE POLLUTANTS: None
 FREIGHT DESCRIPTION: None
 HAZARDOUS MATERIAL SHIPPING DESCRIPTION: None
 SECONDARY: None
 PACKAGING GROUP: None
 PACKAGING EXCEPTIONS: None
 BULK PACKAGING: None
 RQ: None

Section 15: REGULATORY INFORMATION

TSCA STATUS:	Each ingredient is on the Inventory
NSR STATUS (Canada):	Each ingredient is on the DSL
SARA Title III:	Hazard Categories: Acute Health: Yes Chronic Health: No Fire Hazard: No Pressure Hazard: No Reactivity Hazard: No Reportable Ingredients: Sec. 302/304: None Sec. 313: None
California Proposition 65:	No ingredient is listed.
Clean Air Act:	No ingredient is listed
WHMIS (Canada):	Status: Not Controlled WHMIS Classification(s): None

Section 16: Other Information

HMIS AND NFPA HAZARD RATING:	Category	HMIS	NFPA
	Acute Health	1	1
	Flammability	0	0
	Reactivity	0	0

NFPA Unusual Hazards: None.
HMIS Personal Protection: To be supplied by user depending upon use.

END OF MSDS

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HJ3 Carbon Fiber Composite (CL-510)

Description

The HJ3 Carbon Composite is a pre-cured carbon plate designed for strengthening flat surfaces such as steel girders, wood girders, and concrete and masonry walls.

HJ3 L-Series carbon laminates are bonded to substrates with the HJ3 Tack Coat Epoxies (TC-300, TC-310).

TYPICAL DATA FOR HJ3 Carbon Fiber Composite	
STORAGE CONDITIONS	Store dry at 40°F-95°F
COLOR	Black

Suggested Uses

- Flexural strengthening of concrete, steel and wood beams
- Increase flexural and shear forces of concrete and masonry walls

Advantages

- Corrosion resistant – minimizing costs and wear
- Adds only a 1/16th of an inch to the repaired surface
- Light weight (4 ounces per square foot)
- Reduces installation time since heavy equipment and welding is eliminated
- Low thermal expansion
- Minimal change to structure's shape, weight and appearance
- Used for increasing strength, stiffness, fatigue resistance of damaged structure up to and at times beyond its initial design value
- Minimal disruption and noise
- Economical

PHYSICAL STRENGTHS	TYPICAL VALUES	DESIGN VALUES	ASTM TEST METHOD
Tensile Strength (ksi)	237.9	197.1	D3039
Modulus of Elasticity (ksi)	21,157	18,527	D3039
Effective Ply Thickness (in.)	.062		

Shipping

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Surface Preparation

The preparation of surfaces to receive the HJ3 Carbon Fiber Composite must be given careful attention, as **the bonding capability of the epoxy for a given application is primarily dependent on proper surface preparation**. Concrete surfaces must be structurally sound and free from contaminants such as dust, oil or dirt. Surfaces must be shot blasted or mechanically abraded to achieve a minimum 3-mil profile. Remove fins, sharp edges, and protrusions that may trap air behind the installed wrap. Coated surfaces must be mechanically cleaned and abraded to the equivalent of 60 - 80 mesh. Repair all damaged concrete, spills and irregular surfaces and fill uneven surfaces with HJ3 putty mix (PM-100).

Mixing Epoxy

Thorough and complete mixing is critical. **WARNING: Epoxies develop heat during mixing and curing.** To keep temperature rise to a minimum, a high surface area to volume ratio during mixing is recommended. For manual mixing, each mix volume should be kept to 5 gallons or less. For automated mixing follow the equipment manufacturer's instruction.

First, mix each component separately. Proportion each component at their specified ratio and mix using a slow-speed drill with jiffy paddle at 400-600 RPM for 3-5 minutes until a consistent gray color is achieved. No stripes, streaks, or color variation should be visible. Use an up and down motion, scraping the mixing container sides and bottom. **Mix no more material than may be applied within the specified pot life of the epoxy.**

Application of Laminate Strips

STEP 1: Using a roller or sprayer, apply 5 to 10 mils of (HJ3's PC-100 onto the prepared surface. **STEP 2:** Apply 60 to 80 mils of HJ3's Tack Coat Epoxy wet to the primed surface. Due to the porosity of substrate, application rate may vary. **STEP 3:** Apply the laminate strip and press to assure a good bond and to remove any entrapped air. **STEP 4:** Apply paint or coating as needed.

When multi-layer strips are used, each individual layer shall be firmly bedded and adhered to the preceding layer. Always place the sanded surface of the laminate in contact with the epoxy. Therefore, in multiplayer applications or when coating and painting is desired, use laminates with both sides sanded.



Step 1: Prepare Surface



Step 2: Mix & Apply StrongHold™ Resin Wall and Carbon Strap



Step 3: Place StrongHold™ Carbon Strap to Wall



Step 4: Apply Paint

Curing of Strips

Curing times and temperature for strip shall be maintained for the designated formulation used, according to the instructions supplied with the HJ3 adhesive.

Procedure Modifications

Due to environmental factors affecting quality of work, installation procedures may be modified to achieve maximum results. Procedure modifications shall be discussed with and approved by the Engineer of record prior to implementing the modifications.

Conditions to Avoid

- Do not apply to concrete with temperature outside of application temperature range
- Do not apply to concrete less than 30 days old
- Do not apply to concrete with curing or sealing membranes
- Do not apply to base concrete at a temperature less than 45 °F

**MATERIAL DATA SAFETY SHEET (MSDS)
for HJ3 Carbon Composite (CL-510)**

REV DATE: 1 JAN 2008
REVISION: 1

Section 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **HJ3 Carbon Fiber Composite (CL-510)**

SYNONYMS: All product grades

CHEMICAL FAMILY:

MOLECULAR FORMULA: Fiber carbon (Silicate Base) and cured Epoxy Resin

MOLECULAR WGT:

MFR'S NAME: HJ3 Composite Technologies, LLC, 4100 S. Fremont Ave., Tucson, AZ 85714

EMERGENCY PHONE: 800/535-5053 (Infotrac) GENERAL INFORMATION: 877/303-0453 (HJ3)

Section 2: HAZARDOUS INGREDIENTS

OSHA REGULATED COMPONENTS

Component	CAS. NO.	%	Threshold Limit Value (TLV) of dust
1. Fibercarbon (Silicate Base)	N/A	68	* 10 mg./M ³
2. Cured epoxy resin (Inert Dust)	N/A	32	** 5 mg./ M ³
Total 1 & 2	N/A		15 mg./ M ³

* TLV – Threshold limit value for fibrous carbon dust for 8-hr time weighed average.

** TLV – Threshold limit value for inert dust for 8-hr timer weighed average.

Section 3: PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

APPEARANCE: (Fibercarbon) White fiber

PHYSICAL STATE: Solid

ODOR: None

VAPOR PRESS: Not applicable

BOILING PT: Not applicable

MELT PT: Not applicable

SPECIFIC GRAVITY: 1.847

SOLUBILITY IN H₂O: Not Soluble

% VOLATILE (BY WT): Not applicable

pH: Not applicable

SATURATION IN AIR (% BY VOL): Not applicable

VOLATILE ORGANIC CONTENT: Not applicable

FLASH POINT: Not applicable.

FLAMMABLE LIMITS (% BY VOL): Not applicable.

AUTOIGNITION TEMP: Not available.

DECOMPOSITION TEMP: Not available.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS: This material will not burn easily. Use foam, CO₂, or dry chemical. Wear self-contained, positive pressure breathing apparatus.

Section 4: PHYSICAL HAZARDS

Stability: Stable

Hazardous Decomposition Products: Combustion of epoxy resins are phenolics, C) and water

Section 5: HEALTH HAZARDS

Threshold Limit Value: 10 mg./M³ for fibrous carbon dust
5 mg./M³ for inert dust

Signs & Symptoms of Exposure: Skin, eye, and upper respiratory tract irritation

Chronic Overexposure: Very unlikely to occur with normal use

Medical Conditions Aggravated by Exposure: Possibly cause mechanical irritation and transitory dermatitis

National Toxicology Program: N/A

I.A.R.C. Monographs: N/A

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OSHA: N/A

OSHA Permissible Exposure Limit: 15 mg./M³ Total fiber dust

EMERGENCY & FIRST AID PROCEDURES

INHALATION: Move to fresh area
EYES: Flush with flowing water for 15 minutes
SKIN: Flush with ample water followed by washing with mild soap to remove accumulated fibers
INGESTION: Not likely to occur through normal use

Section 6: SPECIAL PROTECTION INFORMATION

Respiratory Protection: If air borne dust of fibers exceeds TLV values, use respirator designed for nuisance type dusts.
Ventilation: Local exhaust system recommended
Optional Equipment: Dust collection system
Protective Clothing: Gloves, goggles, and shirts with long sleeves are recommended

Section 7: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Handling/Storage Precautions: None
Procedure for Spill/Release: N.A.
Waste disposal method: None – use standard disposal

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Modulus of Elasticity (ksi)	21,800	21,000	D3039
Effective Ply Thickness (in.)	.061		

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- Do not apply to concrete with curing or sealing membranes
- Do not apply to base concrete at a temperature less than 45 °F

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for HJ3 Carbon Composite (CL-511)**

REV DATE: 1 JAN 2008
REVISION: 1

Section 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **HJ3 Carbon Fiber Composite (CL-511)**
SYNONYMS: All product grades
CHEMICAL FAMILY:
MOLECULAR FORMULA: Fiber carbon (Silicate Base) and cured Epoxy Resin
MOLECULAR WGT:
MFR'S NAME: HJ3 Composite Technologies, LLC, 4100 S. Fremont Ave., Tucson, AZ 85714
EMERGENCY PHONE: 800/535-5053 (Infotrac) GENERAL INFORMATION: 877/303-0453 (HJ3)

Section 2: HAZARDOUS INGREDIENTS

OSHA REGULATED COMPONENTS

Component	CAS. NO.	%	Threshold Limit Value (TLV) of dust
1. Fibercarbon (Silicate Base)	N/A	68	* 10 mg./M ³
2. Cured epoxy resin (Inert Dust)	N/A	32	** 5 mg./ M ³
Total 1 & 2	N/A		15 mg./ M ³

* TLV – Threshold limit value for fibrous carbon dust for 8-hr time weighed average.

** TLV – Threshold limit value for inert dust for 8-hr timer weighed average.

Section 3: PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion Data)

APPEARANCE: (Fibercarbon) White fiber
PHYSICAL STATE: Solid
ODOR: None
VAPOR PRESS: Not applicable
BOILING PT: Not applicable
MELT PT: Not applicable
SPECIFIC GRAVITY: 1.847
SOLUBILITY IN H₂O: Not Soluble
% VOLATILE (BY WT): Not applicable
pH: Not applicable
SATURATION IN AIR (% BY VOL): Not applicable
VOLATILE ORGANIC CONTENT: Not applicable

FLASH POINT: Not applicable.
FLAMMABLE LIMITS (% BY VOL): Not applicable.
AUTOIGNITION TEMP: Not available.
DECOMPOSITION TEMP: Not available.
EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS: This material will not burn easily. Use foam, CO₂, or dry chemical. Wear self-contained, positive pressure breathing apparatus.

Section 4: PHYSICAL HAZARDS

Stability: Stable
Hazardous Decomposition Products: Combustion of epoxy resins are phenolics, C) and water

Section 5: HEALTH HAZARDS

Threshold Limit Value: 10 mg./M³ for fibrous carbon dust
5 mg./M³ for inert dust
Signs & Symptoms of Exposure: Skin, eye, and upper respiratory tract irritation
Chronic Overexposure: Very unlikely to occur with normal use
Medical Conditions Aggravated by Exposure: Possibly cause mechanical irritation and transitory dermatitis

National Toxicology Program: N/A
I.A.R.C. Monographs: N/A

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OSHA: N/A

OSHA Permissible Exposure Limit: 15 mg./M³ Total fiber dust

EMERGENCY & FIRST AID PROCEDURES

INHALATION: Move to fresh area
EYES: Flush with flowing water for 15 minutes
SKIN: Flush with ample water followed by washing with mild soap to remove accumulated fibers
INGESTION: Not likely to occur through normal use

Section 6: SPECIAL PROTECTION INFORMATION

Respiratory Protection: If air borne dust of fibers exceeds TLV values, use respirator designed for nuisance type dusts.
Ventilation: Local exhaust system recommended
Optional Equipment: Dust collection system
Protective Clothing: Gloves, goggles, and shirts with long sleeves are recommended

Section 7: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Handling/Storage Precautions: None
Procedure for Spill/Release: N.A.
Waste disposal method: None – use standard disposal

END OF MSDS

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HJ3 Carbon Fiber Composite (CL-512)

Description

The HJ3 Carbon Composite is a pre-cured carbon plate designed for strengthening flat surfaces such as steel girders, wood girders, and concrete and masonry walls. HJ3 L-Series carbon laminates are bonded to substrates with the HJ3 Tack Coat Epoxies (TC-300, TC-310).

TYPICAL DATA FOR HJ3 Carbon Fiber Composite	
STORAGE CONDITIONS	Store dry at 40°F-95°F
COLOR	Black

Suggested Uses

- Flexural strengthening of concrete, steel and wood beams
- Increase flexural and shear forces of concrete and masonry walls

Advantages

- Corrosion resistant – minimizing costs and wear
- Adds only a 1/16th of an inch to the repaired surface
- Light weight (4 ounces per square foot)
- Reduces installation time since heavy equipment and welding is eliminated
- Low thermal expansion
- Minimal change to structure's shape, weight and appearance
- Used for increasing strength, stiffness, fatigue resistance of damaged structure up to and at times beyond its initial design value
- Minimal disruption and noise
- Economical

PHYSICAL STRENGTHS	TYPICAL VALUES	DESIGN VALUES	ASTM TEST METHOD
Tensile Strength (ksi)	249.4	221.6	D3039
Modulus of Elasticity (ksi)	23,713	13,885	D3039
Effective Ply Thickness (in.)	.062		

Shipping

*Shipped FOB Tucson, AZ or through authorized distributors.

Surface Preparation

The preparation of surfaces to receive the HJ3 Carbon Fiber Composite must be given careful attention, as **the bonding capability of the epoxy for a given application is primarily dependent on proper surface preparation.** Concrete surfaces must be structurally sound and free from contaminants such as dust, oil or dirt. Surfaces must be shot blasted or mechanically abraded to achieve a minimum 3-mil profile. Remove fins, sharp edges, and protrusions that may trap air behind the installed wrap. Coated surfaces must be mechanically cleaned and abraded to the equivalent of 60 - 80 mesh. Repair all damaged concrete, spills and irregular surfaces and fill uneven surfaces with HJ3 putty mix (PM-100).

Mixing Epoxy

Thorough and complete mixing is critical. **WARNING: Epoxies develop heat during mixing and curing.** To keep temperature rise to a minimum, a high surface area to volume ratio during mixing is recommended. For manual mixing, each mix volume should be kept to 5 gallons or less. For automated mixing follow the equipment manufacturer's instruction.

First, mix each component separately. Proportion each component at their specified ratio and mix using a slow-speed drill with jiffy paddle at 400-600 RPM for 3-5 minutes until a consistent gray color is achieved. No stripes, streaks, or color variation should be visible. Use an up and down motion, scraping the mixing container sides and bottom. **Mix no more material than may be applied within the specified pot life of the epoxy.**

Application of Laminate Strips

STEP 1: Using a roller or sprayer, apply 5 to 10 mils of (HJ3's PC-100 onto the prepared surface. **STEP 2:** Apply 60 to 80 mils of HJ3's Tack Coat Epoxy wet to the primed surface. Due to the porosity of substrate, application rate may vary. **STEP 3:** Apply the laminate strip and press to assure a good bond and to remove any entrapped air. **STEP 4:** Apply paint or coating as needed.

When multi-layer strips are used, each individual layer shall be firmly bedded and adhered to the preceding layer. Always place the sanded surface of the laminate in contact with the epoxy. Therefore, in multiplayer applications or when coating and painting is desired, use laminates with both sides sanded.



Step 1: Prepare Surface



Step 2: Mix & Apply StrongHold™ Resin Wall and Carbon Strap



Step 3: Place StrongHold™ Carbon Strap to Wall



Step 4: Apply Paint

Curing of Strips

Curing times and temperature for strip shall be maintained for the designated formulation used, according to the instructions supplied with the HJ3 adhesive.

Procedure Modifications

Due to environmental factors affecting quality of work, installation procedures may be modified to achieve maximum results. Procedure modifications shall be discussed with and approved by the Engineer of record prior to implementing the modifications.

Conditions to Avoid

- Do not apply to concrete with temperature outside of application temperature range
- Do not apply to concrete less than 30 days old
- Do not apply to concrete with curing or sealing membranes
- Do not apply to base concrete at a temperature less than 45 °F

**MATERIAL DATA SAFETY SHEET (MSDS)
for HJ3 Carbon Fiber Composite (CL-512)**

REV DATE: 1 Jan 2008
REVISION: 2

Section 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **HJ3 Carbon Fiber Composite (CL-512)**
SYNONYMS: All product grades
CHEMICAL FAMILY: Carbon
MOLECULAR FORMULA: Polymer
MOLECULAR WGT: Polymer
MFR'S NAME: HJ3 Composite Technologies, LLC, 4100 S. Fremont Ave., Tucson, AZ 85714
EMERGENCY PHONE: 800/535-5053 (Infotrac) GENERAL INFORMATION: 877/303-0453 (HJ3)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

Component	CAS. NO.	TWA/CEILING	REFERENCE
Carbon (As Carbon Fiber)	00744-44-0	Not Established 3 fibers/co	HJ3

Section 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Electrically conductive fibers. Airborne fibers can short circuit electrical equipment. Airborne fiber may cause mechanical irritation of the eyes, skin, nose and throat.

POTENTIAL HEALTH EFFECTS:

- The acute oral (rat) and dermal (rabbit) LD50 values are estimated to be greater than 5,000 mg/kg and greater than 2,000 mg/kg, respectively.
- Direct contact with this material may cause mild eye and skin irritation.
- Refer to Section 11 for toxicological information on the regulated components of this product.

Section 4: FIRST AID MEASURES

◆USE APPROPRIATE BLOOD-BORNE PATHOGENS PROTECTIONS◆

EYE:

- In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

SKIN:

- In case of skin contact wash affected areas of skin with soap and water.

INGESTION:

- If swallowed, call a physician immediately. Only induce vomiting at the instructions of a physician. Never give anything by mouth to an unconscious patient.

INHALATION:

- If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing. Obtain medical attention immediately if necessary.

Section 5: FIRE FIGHTING MEASURES

FLASH POINT: Not applicable.

FLAMMABLE LIMITS (% BY VOL): Not applicable.

AUTOIGNITION TEMP: Not available.

DECOMPOSITION TEMP: Not available.

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS: This material will not burn easily. Use an extinguishing media appropriate for the surrounding fire. Wear self-contained, positive pressure breathing apparatus.

Section 6: ACCIDENTAL RELEASE MEASURES

Sweep up spills and place in a waste disposal container. Flush area with water.

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Section 7: HANDLING AND STORAGE

Keep container closed.

Maintain good housekeeping to control dust accumulations.

IMPORTANT!! Airborne fibers are electrically conductive and may cause short circuits. Do not let fibers come in contact with electrical equipment.

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE): Engineering controls are not usually necessary if good hygiene practices are followed. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Avoid unnecessary skin contact. Impervious gloves are recommended to prevent prolonged skin contact. For operations where eye or face contact can occur, eye protection is recommended.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Black fiber

PHYSICAL STATE: Solid

ODOR: None

VAPOR PRESS: Not applicable

BOILING PT: Not applicable

MELT PT: >5,000 °F; 2760 °C

SPECIFIC GRAVITY: 1.8

SOLUBILITY IN H₂O: Negligible

% VOLATILE (BY WT): Not applicable

pH: Not applicable

SATURATION IN AIR (% BY VOL): Not applicable

VOLATILE ORGANIC CONTENT: Not applicable

Section 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: None known.

INCOMPATIBILITY: No specific incompatibility.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION: Oxides of carbon.

Section 11: TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the OSHA regulated components of this product is as follows:

Carbon fibers may cause mechanical irritation of the eyes, skin, nose and throat. Airborne carbon fibers are not considered respirable. A typical carbon fiber may be characterized as having a diameter of 5-7 microns and a length of greater than 100 microns. Fibers with diameters greater than 3.5 microns are not considered respirable.

Section 12: ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

OCTANOL/H₂O Partition COEF: Not applicable

Section 13: DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the HJ3 product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA "listed hazardous waste" or has any of the four RCRA "hazardous characteristics." Refer to 40 CFR Part 261.33 to determine if the given material to be disposed of is a RCRA "listed hazardous waste;" information contained in section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 5 of this MSDS (flash point). For Corrosivity, see sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than federal regulations, may also apply to the classification of the material if it is to be disposed. HJ3 encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as waste. HJ3 recommends that organic

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materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. HJ3 has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

Section 14: TRANSPORT INFORMATION

This product is not regulated as a dangerous or hazardous good according to the regulations of DOT, IMO, or IATA. Therefore, no hazard label, hazard class, or UN number is applicable to this product.

Section 15: REGULATORY INFORMATION

INVENTORY INFORMATION

US TSCA:	All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U.S.C. 2601 et seq.
Canada DSL:	Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environment Protection Act and are included on the Domestic Substances List.
EEC EINECS:	All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.
Other Environmental Information	The following components for this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc) See Section 13 for information on waste classification and waste disposal of this product.

Component	CAS. NO.	%	TPQ (lbs)	RQ (lbs)	S313	TSCA 12B
This product does not contain any components regulated under these sections of the EPA						

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA
 Not Applicable under SARA TITLE III

Section 16: Other Information

NFPA HAZARD RATING (National Fire Protection Association)
 FIRE: Materials that must be pre-heated before ignition can occur.
 HEALTH: Materials that, under emergency conditions, can cause significant irritation
 REACTIVITY: Materials in themselves are normally stable, even under fire exposure conditions.

Fire
1
 Health **1** **0** Reactivity
 --
 Special

END OF MSDS

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