

RICHTECH INDUSTRIES
CARBON FIBER SYSTEM

RI P3500 Low Viscosity Primer

TECHNICAL DATA GUIDE

YIELD

Part A – 3 qts; 2 gal pail; 7 lbs

Part B – 1 qt; 1 qt can; 2 lbs

VOLUME PACKAGING WEIGHT

Steel

250 to 325 ft²/gal (6.1 to 8.0 m²/L)

Concrete

200 to 250 ft²/gal (4.9 to 6.1 m²/L)

Masonry (Concrete)

150 to 200 ft²/gal (3.8 to 4.9 m²/L)

Masonry (Clay)

200 to 250 ft²/gal (4.9 to 6.1 m²/L)

(Coverage rate on concrete and masonry may vary depending on density and porosity of the substrate)

PACKAGING

Available in 1 gal (3.8 L) units.

Each unit is packaged as follows:

COLOR

Part A – Amber

Part B – Clear

Mixed – Amber

SHELF LIFE

18 months when properly stored

STORAGE

Store in unopened containers in a clean, dry area between 50 and 90°F (10 to 32°C) away from direct sunlight, flame or other hazards.

DESCRIPTION

RI P3500 is a low viscosity, 100% solids, polyamine cured epoxy. As the first applied component of the Richtech Carbon Fiber System, it is used to penetrate the pore structure of cementitious substrates and to provide a high bond base coat for the Richtech Carbon Fiber System. RI P3500 is based on a unique adduct curing technology that results in tolerance for surface moisture and for ambient temperatures down to 35°F (2°C)

APPLICATIONS

RI P3500 is the first component of the Richtech Carbon Fiber System that is applied to concrete, steel, and masonry substrates. RI P3500 is used to provide excellent adhesion of the Richtech Carbon Fiber System to the substrate. RI P3500 is the first component any Richtech Carbon Fiber installation

- Vertical
- Horizontal
- Exterior
- Interior

PRODUCT HIGHLIGHTS

- Low viscosity easily penetrates pore structure of concrete
- 100% solids epoxy
- Low odor, low VOC's
- Suitable for low-temperature application can be applied if ambient temperature is 35°F and rising; extends application window in cooler conditions

SUBSTRATES

- Concrete
- Masonry
- Steel

TECHNICAL DATA

COMPOSITION

RI P3500 is a two component polyamine cured epoxy

NOTES:

- (1) Based on testing of cured samples per ASTM D 638 at 72° F (20° C) and 40% relative humidity.
- (2) Based on testing of cured samples per ASTM D 695 at 72° F (20° C) and 40% relative humidity.
- (3) Based on testing of cured samples per ASTM D 790 at 72° F (20° C) and 40% relative humidity.
- (4) Based on testing of cured samples at 72° F (20° C) and 40% relative humidity.

PHYSICAL PROPERTIES

PROPERTY	VALUE
Installed Thickness (approx)	3 mils (0.075 mm)
Density	68.8 pcf (1102 kg/m ³)

COMPRESSIVE PROPERTIES (2)

PROPERTY	VALUE
Yield Strength	3800 psi (26.2 MPa)
Strain at Yield	4.0%
Elastic Modulus	97 ksi (670 MPa)
Ultimate Strength	4100 psi (28.3 MPa)
Rupture Strain	10%

FUNCTIONAL PROPERTIES (4)

PROPERTY	VALUE
CTE	20·10 ⁻⁶ /° F (35·10 ⁻⁶ /° C)
Thermal Conductivity	1.39 Btu·in/hr·ft ² ° F; (0.20 W/m·° K)
Glass Transition Temp, Tg	171° F (77° C)

TENSILE PROPERTIES (1)

PROPERTY	VALUE
Yield Strength	2100 psi (14.5 MPa)
Strain at Yield	2.0%
Elastic Modulus	105 ksi (717 MPa)
Ultimate Strength	2500 psi (17.2 MPa)
Rupture Strain	40%
Poisson's Ratio	0.48

FLEXURAL PROPERTIES (3)

PROPERTY	VALUE
Yield Strength	3500 psi (24.1 MPa)
Strain at Yield	4.0%
Elastic Modulus	86.3 ksi (595 MPa)
Ultimate Strength	3500 psi (24.1 MPa)
Rupture Strain	Large deformation with no rupture

HANDLING PROPERTIES

PROPERTY	VALUE
Mixed Weight	9.2 lb/gal (1103 g/L)
VOC Content	84.1 g/L less water and exempt solvents
Flash Point	Part A: 204° F (95° C) Part B: > 200° F (93° C) (Pensky-Martens Closed Cup)
Mixed Viscosity	
at 50° F (10° C)	1200 cps
at 77° F (25° C)	400 cps
at 90° F (32° C)	200 cps

HOW TO APPLY

SURFACE PREPARATION

1. Substrate should be fully cured, clean, sound, and dry. Any damaged areas, spalled areas, delaminated areas, or areas with corrosion damage must be repaired prior to applying the system.
2. For concrete and masonry substrates, mechanically prepare the substrate to remove coatings, laitance, and all miscellaneous surface contaminants and to provide a proper surface profile. Surface profile should be a minimum of ICRI CSP 3 (similar to 80 grit sandpaper).
3. For steel substrates, abrasive blast to "white metal" in accordance with Society for Protective Coatings (SSPC) Specification SP-5-89 or NACE No. 1, using clean, dry abrasive to obtain a minimum 3 mil profile.

MIXING

1. The mix ratio is 3:1 (Part A to Part B) by volume or 100:30 (Part A to Part B) by weight. Mix only the amount of material that can be used within the working time of the material. Approximate working times for a 1 Gal (3.8 L) unit are:
 - 75 min at 50° F (10° C)
 - 20 min at 77° F (25° C)
 - 10 min at 90° F (32° C)
2. Carefully measure (ratio) each component and then add Part B (hardener) to Part A (resin).
3. Mix Parts A and B using a low-speed drill (600 rpm) and mixing paddle (e.g., a Jiffy mixer). Carefully scrape the sides and bottom of the container while mixing. Keep the paddle below the surface of the material to avoid entrapping air. Proper mixing will take at least 3 – 5 minutes. Well-mixed material will be free of streaks or lumps.

APPLICATION

1. Apply the material in areas to receive the Richtech Carbon Fiber system using a 3/8" nap roller or short bristle brush to a wet film thickness of approximately 3-mils.
2. Spray application is not recommended.

CLEAN UP

Use xylene or methyl ethyl ketone. Observe fire and health precautions with solvents.

MAINTENANCE

Periodically inspect the applied material and repair localized areas as needed. Consult a Richtech representative for additional information.

FOR BEST PERFORMANCE

- Only apply RI P3500 the ambient temperature is between 35° and 120° F (2° and 50° C).
- Subsequent components of the Richtech Carbon Fiber System should be applied within 48 hours of applying RI P3500
- If more than 48 hours have passed following application of RI P3500 the surface shall be lightly abraded and cleaned with a solvent wipe prior to applying the next component.
- Make certain the most current versions of product data sheet and SDS are being used; call Customer Service (1-800-677-7791) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

OBSERVE WORKING TIME LIMITATIONS

- Catalyze no more material than can be applied within the work time period.
- Available work time, temperature and complexity of the application area will determine how much material should be catalyzed at one time.
- Keep material cool and shaded from direct sunlight in warm weather. During hot weather, work time can be extended by keeping material cool before and after mixing or by immersing pot in ice water.

WARNING

Vapor may be harmful. Contains epoxy resins and curing agent. May cause skin sensitivity or other allergic responses. Keep away from heat, sparks or open flame. In enclosed areas or where ventilation is poor use an approved air mask and utilize adequate safety precautions to prevent fire or explosion. In case of skin contact, wash with soap and water. For eyes, flush immediately (seconds count) with water for 15 minutes and CALL A PHYSICIAN. If swallowed, CALL A PHYSICIAN IMMEDIATELY. Product Safety Data Sheets (SDS) are available and should be consulted and on hand whenever handling these products. These products are for professional and industrial use only and are installed only by trained and qualified applicators. Trained applicators must follow installation instructions.

HEALTH, SAFETY AND ENVIRONMENTAL

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For medical emergencies only, call ChemTrec® 1-800-424-9300.

LIMITED WARRANTY NOTICE

Every reasonable effort is made to apply Richtech Carbon Fiber exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, Richtech **MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS**, and Richtech shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the Richtech Technical Manager.

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RICHTECH INDUSTRIES

CARBON FIBER SYSTEM

RI F2000 High Viscosity Epoxy Paste

TECHNICAL DATA GUIDE

YIELD100 to 250 ft²/gal (4.9 to 6.1 m²/L)

(Coverage rate on concrete and masonry may vary depending on density and porosity of the substrate)

PACKAGING

Part A – 3 qts; 2 gal pail; 8 lbs

Part B – 1 qt; 1 qt can; 2.5 lbs

Available in 1 gal (3.8 L) units.

Each unit is packaged as follows:

COLOR

Part A – Light Gray

Part B – Charcoal

Mixed – Gray

SHELF LIFE

18 months when properly stored

STORAGE

Store in unopened containers in a clean, dry area between 50 and 90°F (10 to 32°C) away from direct sunlight, flame or other hazards.

DESCRIPTION

RI F2000 is a 100% solids non-sag epoxy paste for use with the Richtech Carbon Fiber System. It is used level small surface defects and to provide a smooth surface to which the Richtech Carbon Fiber System will be applied.

APPLICATIONS

- Fill small voids or smooth small offsets on cementitious substrates
- Sealing of cracks prior to epoxy-injection
- Vertical
- Horizontal
- Exterior
- Interior

PRODUCT HIGHLIGHTS

- 100% solids epoxy
- Low odor, low VOC's
- Suitable for low-temperature application can be applied if temperature is 35°F and rising; extends application window in cooler conditions
- High viscosity
- Can be used in vertical and overhead applications

SUBSTRATES

- Concrete
- Masonry
- Steel

TECHNICAL DATA

COMPOSITION

Two part, 100% solids, non-sag epoxy paste

NOTES:

- (1) Based on testing of cured samples per ASTM D 638 at 72 ° F (20 ° C) and 40% relative humidity.
- (2) Based on testing of cured samples per ASTM D 695 at 72 ° F (20 ° C) and 40% relative humidity.
- (3) Based on testing of cured samples per ASTM D 790 at 72 ° F (20 ° C) and 40% relative humidity.
- (4) Based on testing of cured samples at 72 ° F (20 ° C) and 40% relative humidity.

PHYSICAL PROPERTIES

PROPERTY	REQUIREMENT
Density	75.8 pcf (1258 kg/m ³)

COMPRESSIVE PROPERTIES (2)

PROPERTY	REQUIREMENT
Yield Strength	3300 psi (22.8 MPa)
Strain at Yield	4.0%
Elastic Modulus	155 ksi (1076 MPa)
Ultimate Strength	3300 psi (22.8 MPa)
Rupture Strain	10%

FUNCTIONAL PROPERTIES (4)

PROPERTY	REQUIREMENT
CTE	20·10 ⁻⁶ /° F (35·10 ⁻⁶ /° C)
Thermal Conductivity	1.32 Btu·in/hr·ft ² ° F (0.19 W/m·°K)
Glass Transition Temp, Tg	168° F (75° C)

TENSILE PROPERTIES (1)

PROPERTY	REQUIREMENT
Yield Strength	1800 psi (12 MPa)
Strain at Yield	1.5%
Elastic Modulus	260 ksi (1800 MPa)
Ultimate Strength	2200 psi (15.2 MPa)
Rupture Strain	7%
Poisson's Ratio	0.48

FLEXURAL PROPERTIES (3)

PROPERTY	REQUIREMENT
Yield Strength	3800 psi (26.2 MPa)
Strain at Yield	4.0%
Elastic Modulus	130 ksi (895 MPa)
Ultimate Strength	4000 psi (27.6 MPa)
Rupture Strain	7%

HANDLING PROPERTIES

PROPERTY	REQUIREMENT
Mixed Weight	10.5 lb/gal (1259 g/L)
VOC Content	Content 89 g/L less water and exempt solvents. (EPA Method 24)
Flash Point	Part A: 210° F (99° C) Part B: >200° F (93° C) (Pensky-Martens Closed Cup)
Mixed Viscosity	
at 50° F (10° C)	74,000 cps
at 77° F (25° C)	45,000 cps
at 90° F (32° C)	33,000 cps

HOW TO APPLY

SURFACE PREPARATION

1. RI F2000 should be applied to a substrate primed with RI P3500. The putty can be applied before or after the primer coat has achieved full cure. Surfaces with a tack-free primer coat must be lightly sanded and cleaned of any dust, oils, or other surface contaminants.

MIXING

- The mix ratio is 3:1 (Part A to Part B) by volume or 100:30 (Part A to Part B) by weight. Mix only the amount of material that can be used within the working time of the material. Approximate working times for a 1 Gal (3.8 L) unit are:
 - 95 min at 50° F (10° C)
 - 40 min at 77° F (25° C)
 - 15 min at 90° F (32° C)
- Part A (resin) must be pre-mixed using a low speed drill (600 rpm) and mixing paddle (e.g., a Jiffy Mixer). Keep the paddle below the surface of the material to avoid entrapping air. Pre-mix for a minimum of 3 minutes.
- Carefully measure (ratio) each component and then add Part B (hardener) to Part A (resin).
- Mix Parts A and B using a low-speed drill (600 rpm) and mixing paddle (e.g., a Jiffy mixer). Carefully scrape the sides and bottom of the container while mixing. Keep the paddle below the surface of the material to avoid entrapping air. Proper mixing will take at least 3 – 5 minutes. Well-mixed material will be free of streaks or lumps.
- If a thicker consistency is desired, silica flour (S-11 Powder) may be mixed into the material using a low-speed drill and mixing paddle. Add as much silica flour as is needed to achieve the desired consistency.

APPLICATION

- Apply the RI F2000 to the primed substrate using a spring-steel trowel.
- The material should be applied by pulling a “tight” trowel. That is the RI F2000 should only fill small voids and smooth small offsets in the substrate. High build or thick applications of the RI F2000 are not recommended.

CLEAN UP

Use xylene or methyl ethyl ketone. Observe fire and health precautions with solvents.

MAINTENANCE

Periodically inspect the applied material and repair localized areas as needed. Consult a Richtech representative for additional information.

FOR BEST PERFORMANCE

- Only apply RI F2000 the ambient temperature is between 35° and 120° F (2° and 50° C).
- Subsequent components of the Richtech Carbon Fiber System should be applied within 48 hours of applying RI F2000 to the substrate to assure proper adhesion.
- If more than 48 hours have passed following application of RI F2000 the surface shall be lightly abraded and cleaned with a solvent wipe prior to applying the next component.
- Make certain the most current versions of product data sheet and SDS are being used; call Customer Service (1-800-677-7791) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

OBSERVE WORKING TIME LIMITATIONS

- Catalyze no more material than can be applied within the work time period.
- Available work time, temperature and complexity of the application area will determine how much material should be catalyzed at one time.
- Keep material cool and shaded from direct sunlight in warm weather. During hot weather, work time can be extended by keeping material cool before and after mixing or by immersing pot in ice water.

WARNING

Vapor may be harmful. Contains epoxy resins and curing agent. May cause skin sensitivity or other allergic responses. Keep away from heat, sparks or open flame. In enclosed areas or where ventilation is poor use an approved air mask and utilize adequate safety precautions to prevent fire or explosion. In case of skin contact, wash with soap and water. For eyes, flush immediately (seconds count) with water for 15 minutes and CALL A PHYSICIAN. If swallowed, CALL A PHYSICIAN IMMEDIATELY. Product Safety Data Sheets (SDS) are available and should be consulted and on hand whenever handling these products. These products are for professional and industrial use only and are installed only by trained and qualified applicators. Trained applicators must follow installation instructions.

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LIMITED WARRANTY NOTICE

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RICHTECH  **INDUSTRIES**
CARBON FIBER SYSTEM

RI SAT4500 Epoxy Encapsulation Resin

TECHNICAL DATA GUIDE

YIELD

RI FIB 300/50 CFS Fabric

 55 ft²/gal (1.35 m²/L)

RI FIB 600/50 CFS Fabric

 45 ft²/gal (1.1 m²/L)

RI FIB 900/50 FG Fabric

 35 ft²/gal (0.85 m²/L)

COVERAGE

Coverage rates are based on square footage (meters) of fabric. Contact a Richtech representative for coverage rates for other fabric types.

PACKAGING

Available in 1 gal (3.8 L) units.

Each unit is packaged as follows:

COLOR

Part A – Blue

Part B – Clear

Mixed – Blue

SHELF LIFE

18 months when properly stored

STORAGE

Store in unopened containers in a clean, dry area between 50 and 90°F (10 to 32°C) away from direct sunlight, flame or other hazards.

DESCRIPTION

RI SAT4500 is a 100% solids, low viscosity epoxy material that is used to encapsulate Richtech carbon, glass and aramid fiber fabrics. When reinforced with Richtech fiber fabrics, the RI SAT4500 cures to provide a high performance FRP laminate. The resulting FRP laminate can provide additional strength to concrete, masonry, steel, and wood structural elements.

PRODUCT HIGHLIGHTS

- Used to encapsulate any Richtech fabric
- Moderate viscosity
- Can be applied in vertical and overhead applications, but still adequately saturates Richtech fabrics
- 100% solids epoxy
- Low odor, low VOC's

SUBSTRATES

- Concrete
- Masonry
- Steel

LOCATIONS

- Vertical
- Horizontal
- Exterior
- Interior

TECHNICAL DATA

COMPOSITION

Two part, 100% solids, sag resistant epoxy

NOTES:

- (1) Based on testing of cured samples per ASTM D 638 at 72 ° F (20 ° C) and 40% relative humidity.
- (2) Based on testing of cured samples per ASTM D 695 at 72 ° F (20 ° C) and 40% relative humidity.
- (3) Based on testing of cured samples per ASTM D 790 at 72 ° F (20 ° C) and 40% relative humidity.
- (4) Based on testing of cured samples at 72 ° F (20 ° C) and 40% relative humidity.

PHYSICAL PROPERTIES

PROPERTY	REQUIREMENT
Density	61.3 pcf (983-kg/m ³)

COMPRESSIVE PROPERTIES (2)

PROPERTY	REQUIREMENT
Yield Strength	12500 psi (86.2 MPa)
Strain at Yield	5.0%
Elastic Modulus	380 ksi (2620 MPa)
Ultimate Strength	12500 psi (86.2 MPa)
Rupture Strain	5%

FUNCTIONAL PROPERTIES (4)

PROPERTY	REQUIREMENT
CTE	20·10 ⁻⁶ /° F (35·10 ⁻⁶ /° C)
Thermal Conductivity	1.45 Btu·in/hr·ft ² ° F (0.21 W/m·°K)
Glass Transition Temp, Tg	163° F (71° C)

TENSILE PROPERTIES (1)

PROPERTY	REQUIREMENT
Yield Strength	7900 psi (54 MPa)
Strain at Yield	2.5%
Elastic Modulus	440 ksi (3034 MPa)
Ultimate Strength	8000 psi (55.2 MPa)
Rupture Strain	3.5%
Poisson's Ratio	0.40

FLEXURAL PROPERTIES (3)

PROPERTY	REQUIREMENT
Yield Strength	20000 psi (138 MPa)
Strain at Yield	3.8%
Elastic Modulus	540 ksi (3724 MPa)
Ultimate Strength	20000 psi (138 MPa)
Rupture Strain	5%

HANDLING PROPERTIES

PROPERTY	REQUIREMENT
Mixed Weight	8.2 lb/gal (984 g/L)
VOC Content	25 g/L less water and exempt solvents. (EPA Method 24)
Flash Point	Part A: 230° F (110° C) Part B: >200° F (93° C) (Pensky-Martens Closed Cup)
Mixed Viscosity	
at 50° F (10° C)	2500 cps
at 77° F (25° C)	1350 cps
at 90° F (32° C)	900 cps

HOW TO APPLY

SURFACE PREPARATION

1. RI SAT4500 should be applied to a substrate prepared with RI P3500 and RI F2000. The RI SAT4500 can be applied before or after the RI P3500 and RI F2000 have achieved full cure.
2. Surfaces with a tack-free RI P3500/RI F2000 coat must be lightly sanded and cleaned of any dust, oils, or other surface contaminants.

MIXING

1. The mix ratio is 3:1 (Part A to Part B) by volume or 100:30 (Part A to Part B) by weight. Mix only the amount of material that can be used within the working time of the material. Approximate working times for a 1 Gal (3.8 L) unit are:
 - 200 min at 50° F (10° C)
 - 45 min at 77° F (25° C)
 - 15 min at 90° F (32° C)
2. Part A (resin) must be pre-mixed using a low speed drill (600 rpm) and mixing paddle (e.g., a Jiffy Mixer). Keep the paddle below the surface of the material to avoid entrapping air. Pre-mix for a minimum of 3 minutes.
3. Carefully measure (ratio) each component and then add Part B (hardener) to Part A (resin).
4. Mix Parts A and B using a low-speed drill (600 rpm) and mixing paddle (e.g., a Jiffy mixer). Carefully scrape the sides and bottom of the container while mixing. Keep the paddle below the surface of the material to avoid entrapping air. Proper mixing will take at least 3 – 5 minutes. Well-mixed material will be free of streaks or lumps.

APPLICATION

1. Apply the RI SAT4500 using a 3/8" nap roller or short bristle brush to a wet film thickness of 18 to 22 mils.
2. Apply the desired RI fabric into the saturant before the saturant becomes

tacky. (Note some fabrics may require additional RI SAT4500 be applied directly onto the fabric prior to placing the fabric.)

3. Apply a second layer of RI SAT4500 over the RI fabric using a 3/8" nap roller or short bristle brush to a wet film thickness of 18 to 22 mils.
4. If additional layers of RI fabric are required, repeat steps 1 through 3.

CLEAN UP

Use xylene or methyl ethyl ketone. Observe fire and health precautions with solvents.

MAINTENANCE

Periodically inspect the applied material and repair localized areas as needed. Consult a Richtech representative for additional information.

FOR BEST PERFORMANCE

- Only apply RI SAT4500 when the ambient temperature is between 50 and 120° F (10 and 50° C).
- Surfaces subject to UV exposure should be protected with RI HB400, RI HB300SB, or equivalent 100% acrylic top coat.
- Interior surfaces may be coated – consult your local sales representative for available options. Coatings applied over RI SAT4500 should be applied within 48 hours. If more than 48 hours have passed following application of RI SAT4500 the surface shall be lightly abraded and cleaned with a solvent wipe prior to applying the next component
- Make certain the most current versions of product data sheet and SDS are being used; call Customer Service (1-800-677-7791) to verify the most current version.
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OBSERVE WORKING TIME LIMITATIONS

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CFA-005 Carbon Fiber Sheet

TECHNICAL DATA GUIDE

DESCRIPTION

Highest strength, standard modulus fiber available with excellent processing characteristics for filament winding and prepreg. This never twisted fiber is used in high tensile applications like pressure vessels, recreational, and industrial.

FIBER PROPERTIES

	English	Metric	Test Method
Tensile Strength	711 ksi	4,900 MPa	TY-030B-01
Tensile Modulus	33.4 Msi	230 GPa	TY-030B-01
Strain	2.1%	2.1%	TY-030B-01
Density	0.065 lbs/in ³	1.80 g/cm ³	TY-030B-02
Filament Diameter	2.8E-04 in.	7µm	
Yield			
6K	3,724 ft/lbs	400 g/1000m	TY-030B-03
12K	1,862 ft/lbs	800 g/1000m	TY-030B-03
24K	903 ft/lbs	1,850 g/1000m	TY-030B-03
Sizing Type & Amount			
50C		1.0%	TY-030B-05
60E		0.3%	TY-030B-05
F0E		0.7%	TY-030B-05
Twist		Never Twisted	

FUNCTIONAL PROPERTIES

	Metric
CTE	-0.38 a·10 ⁻⁶ /°C
Specific Heat	0.18 Cal/g·°C
Thermal Conductivity	0.0224 Cal/cm·s·°C
Electric Resistivity	1.6 x 10 ⁻³ Ω·cm
Chemical Composition:	
Carbon	93%
Na+K	<50 ppm

COMPOSITE PROPERTIES*

	English	Metric	Test Method
Tensile Strength	370 ksi	2,550 MPa	ASTM D-3039
Tensile Modulus	20.0 Msi	135 GPa	ASTM D-3039
Tensile Strain	1.7%	1.7%	ASTM D-3039
Compressive Strength	215 ksi	1,470 MPa	ASTM D-695
Flexural Strength	245 ksi	1,670 MPa	ASTM D-790
Flexural Modulus	17.5 Msi	120 GPa	ASTM D-790
ILSS	13 ksi	9 kgf/mm ²	ASTM D-2344
90° Tensile Strength	10.0 ksi	69 MPa	ASTM D-3039

COMPOSITE PROPERTIES**

	English	Metric	Test Method
Tensile Strength	370 ksi	2,550 MPa	ASTM D-3039
Tensile Modulus	20.0 Msi	135 GPa	ASTM D-3039
Tensile Strain	1.7%	1.7%	ASTM D-3039
Compressive Strength	230 ksi	1,570 MPa	ASTM D-695
Compressive Modulus	--- ksi	--- GPa	ASTM D-695
In-Plane Shear Strength	14 ksi	98 MPa	ASTM D-3518
ILSS	15.5 ksi	11 kgf/mm ²	ASTM D-2344
90° Tensile Strength	10.0 ksi	70 MPa	ASTM D-3039

The above properties do not constitute any warranty or guarantee of values. These values are not for material selection purposes only. For applications requiring guaranteed values, contact our sales and technical team to establish a material specification document.

*250°F Epoxy Resin. Normalized to 60% fiber volume

**Semi-Toughened 350°F Epoxy Resin. Normalized to 60% fiber volume

PACKAGING

The table below summarizes the tow sizes, twists, sizing types, and packaging available for standard material. Other bobbin sizes may be available on a limited basis.

TOW SIZES	TWIST	SIZING	BOBBIN NET WT. (kg)	BOBBIN TYPE	BOBBIN SIZE					SPOOLS PER CASE	CASE NET WT. (kg)
					a	b	c	d	e		
6k	C	50C	2.0	///	76.5	82.5	280	140	252	12	24
12k	C	50C	6.0	///	76.5	82.5	280	200	252	4	24
	C	60E	6.0	///	76.5	82.5	280	200	252	4	24
	C	F0E	6.0	///	76.5	82.5	280	200	252	4	24
24k	C	50C	6.0	///	76.5	82.5	280	200	252	4	24
	C	60E	6.0	///	76.5	82.5	280	200	252	4	24
	C	F0E	6.0	///	76.5	82.5	280	200	252	4	24

1. Twist A: Twisted yarn B: Untwisted yarn made from a twisted yarn through an untwisting process C: Never twisted yarn

2. Bobbin Type: See Diagram below.

