BASF

The Chemical Company

PRODUCT DATA

3 03 01 30 **Externally Bonded FRP Reinforcement**

MBRACE® PUTTY

High viscosity epoxy paste for the MBrace® Composite Strengthening System

Description

MBrace® Putty is a 100% solids non sag epoxy paste for use with the MBrace® Composite Strengthening System. It is used level small surface defects and to provide a smooth surface to which the MBrace® System will be applied.

Yield

100 to 250 ft²/gal (4.9 to 6.1 m²/L)
(Depending on surface roughness)

Packaging

Available in 1 gal (3.8 L) units. Each unit is packaged as follows:

	VOLUME	PACKAGING	WEIGHT
Part A	3 qts	2 gal pail	8 lbs
Part B	1 qt	1 qt can	2.5 lbs

Color

Part A: Light Gray

Part B: Charcoal

Mixed: Gray

Features

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

Shelf Life

18 months if properly stored in unopened containers (Part A and B)

Storage

Store in a cool, dry place (50 to 90˚F [10 to 32˚C]) away from direct sunlight, flame, or other hazards.

Where to Use

APPLICATION

- Fill small voids or smooth small offsets on cementitious substrates.
- Sealing of cracks prior to epoxy-injection.

LOCATION

- Vertical
- Horizontal
- Exterior
- Interior

SUBSTRATE

- Concrete
- Masonry
- Steel

How to Apply

Surface Preparation

1. MBrace® Putty should be applied to a substrate primed with MBrace® Primer. 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.

Protection and Repair

Technical Data

Composition

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

Handling Properties

PROPERTY	VALUE
Mixed Weight	10.5 lb/gal (1259 g/L)
VOC Content	0.74 lb/gal (89 g/L) (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	

Physical Properties

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

Tensile Properties (1)

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

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%

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%

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, T_g	168 °F (75 °C)

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.

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:

95 min	at 50°F (10°C)
40 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.
5. 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

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

Clean Up

Use T-471, methyl ethyl ketone or acetone. Observe fire and health precautions with solvents.

Maintenance

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

2. Visit us on the web for the most current product information and news: www.BASFBuildingSystems.com.

For Best Performance

- Only apply MBrace® Putty when the ambient temperature is between 35° and 120°F (2° and 50°C).
- Subsequent components of the MBrace® System should be applied within 48 hours of applying MBrace® Putty to the substrate to assure proper adhesion.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current versions.
- 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

1. Catalyze no more material than can be applied within the work time period.

2. Available work time, temperature and complexity of the application area will determine how much material should be catalyzed at one time.

3. 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.

Health and Safety

MBRACE® PUTTY

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 Material Safety Data Sheets (MSDS) are available and should be consulted and on hand whenever handling these products. These
products are for professional and industrial use only and are only installed by trained and qualified applicators. Trained applicators must follow installation instructions.

BASF Building Systems

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The Chemical Company

PRODUCT DATA

3 00 00 00 **Externally Bonded FRP Reinforcement**

MBRACE® PRIMER

Low viscosity epoxy primer for the MBrace® Composite Strengthening System

Description

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

Yield

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:

	VOLUME	PACKAGING	WEIGHT
Part A	3 qts	2 gal pail	7 lbs
Part B	1 qt	1 qt can	2 lbs

Features

	Benefits
• Moisture tolerant	Can be applied on some damp substrates
• 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 temperature is 35 degrees F and rising; extends application window in cooler conditions

Color

Part A: Amber

Part B: Clear

Mixed: Amber

Shelf Life

18 months properly stored in unopened containers (Part A and B)

Storage

Store in a cool, dry place (50 to 90˚ F [10 to 32˚ C]) away from direct sunlight, flame, or other hazards.

Where to Use

APPLICATION

MBrace® Primer is the first component of the MBrace® System that is applied to concrete, steel, and masonry substrates. MBrace® Primer is used to provide excellent adhesion of the MBrace® System to the substrate.

- MBrace® Primer is the first component any MBrace® installation

LOCATION

- Vertical
- Horizontal
- Exterior
- Interior

SUBSTRATE

- Concrete
- Masonry
- Steel

Protection and Repair

Technical Data

Composition

MBrace® Primer is a two component polyamine cured epoxy

Handling Properties

PROPERTY	VALUE
Mixed Weight	9.2 lb/gal (1103 g/L)
VOC Content	0.71 lb/gal (84.1 g/L)
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

Physical Properties

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

Tensile Properties (1)

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

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%

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

Functional Properties (4)

PROPERTY	VALUE
CTE	$20 \cdot 10^{-6}$/˚F ($35 \cdot 10^{-6}$/˚C)
Thermal Conductivity	1.39 Btu·in/hr·ft^2·˚F (0.20 W/m·˚K)
Glass Transition Temp, T_g	171 ˚F (77 ˚C)

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.

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 MBrace system.

2. For concrete and masonry substrates, mechanically prepare the substrate to remove coatings, laitance, and all miscellaneous surface contaminates 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 MBrace 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 T-471, methyl ethyl ketone or acetone. Observe fire and health precautions with solvents.

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult a BASF representative for additional information. Visit us on the web for the most current product information and news: www.BASFBuildingSystems.com.

For Best Performance

- Only apply MBrace® Primer when the ambient temperature is between 35° and 120°F (2° and 50°C).
- Subsequent components of the MBrace® System should be applied within 48 hours of applying MBrace® Primer to the substrate to assure proper adhesion.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Health and Safety

MBRACE® PRIMER

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 Material Safety Data Sheets (MSDS) are available and should be consulted and on hand whenever handling these products.

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PRODUCT DATA

3 03 01 30 **Externally Bonded FRP Reinforcement**

MBRACE® SATURANT

Epoxy encapsulation resin for the MBrace® Composite Strengthening System

Description

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

Yield

	COVERAGE
CF 130 or CF 530 Fabric	55 ft²/gal (5.1 m²/L)
CF 160 or AK 60 Fabric	45 ft²/gal (1.1 m²/L)
EG 900 Fabric	35 ft²/gal (0.85 m²/L)

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

Packaging

Available in 1 gal (3.8 L) and 4 gal (15.2 L) units

Color

Part A: Blue

Part B: Clear

Mixed: Blue

Shelf Life

18 months properly stored in unopened containers (Part A and B)

Storage

Store in a cool, dry area (50 to 90° F [10 to 32° C]) away from direct sunlight, flame, or other hazards.

Features	Benefits
• Moderate viscosity	Can be applied in vertical and overhead applications, but still adequately saturates MBrace® fabrics
• 100% solids epoxy	Low odor, low VOC's

Where to Use

APPLICATION

- Used to encapsulate any MBrace® fabric

LOCATION

- Vertical
- Horizontal
- Exterior
- Interior

SUBSTRATE

- Concrete
- Masonry
- Steel

How to Apply

Surface Preparation

1. MBrace® Saturant should be applied to a substrate prepared with MBrace® Primer and MBrace® Putty. The primer and putty can be applied before or after the they have achieved full cure.

2. Surfaces with a tack-free primer/putty 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.

Protection and Repair

Technical Data

Composition

Two part, 100% solids, sag resistant epoxy

Handling Properties

PROPERTY	VALUE
Mixed Weight	8.2 lb/gal (984 g/L)
VOC Content	0.21 lb/gal (25 g/L) (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

Physical Properties

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

Tensile Properties (1)

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

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%

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%

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, T_g	163 ˚F (71 ˚C)

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.

Application

1. Apply the MBrace® Saturant using a 3/8" nap roller or short bristle brush to a wet film thickness of 18 to 22 mils.

2. Apply the desired MBrace® fabric into the saturant before the saturant becomes tacky. (Note some fabrics may require additional MBrace® Saturant be applied directly onto the fabric prior to placing the fabric.)

3. Apply a second layer of MBrace® Saturant over the MBrace® 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 MBrace® fabric are required, repeat steps 1 through 3.

Clean Up

Use T-471, methyl ethyl ketone or acetone. Observe fire and health precautions with solvents.

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult a BASF representative for additional information. Visit us on the web for the most current product information and news: www.BASFBuildingSystems.com

For Best Performance

- Only apply MBrace® Saturant when the ambient temperature is between 50 and 120° F (10 and 50° C).
- Surfaces should be protected with MBrace® Topcoat, Topcoat ATX, or Topcoat FRL within two days.
- 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.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current versions.
- 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.

Health and Safety

MBRACE® SATURANT

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 Material Safety Data Sheets (MSDS) are available and should be consulted and on hand whenever handling these products. These products are for professional and industrial use only and are only installed by trained and qualified applicators. Trained applicators must follow installation instructions.

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BASF

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PRODUCT DATA

3 03 01 30 **Externally Bonded FRP Reinforcement**

MBRACE® CF 130

Unidirectional high strength carbon fiber fabric for the MBrace® Composite Strengthening System

Description

MBrace® CF 130 is a dry fabric constructed of very high strength, aerospace grade carbon fibers. These fabrics are applied onto the surface of existing structural members in buildings, bridges, and other structures using the MBrace® family of performance polymers. The result is an externally bonded FRP (fiber reinforced polymer) reinforcement system that is engineered to increase the strength and structural performance of these members. Once installed, the MBrace® System delivers externally bonded reinforcement with outstanding long-term physical and mechanical properties.

Yield

269 ft² (25 m²) per roll

Packaging

Available in rolls 20 in (500 mm) wide, 162 ft (50 m) long

ROLL	WIDTH	LENGTH
269 ft² (25 m²)	20 in (508 mm)	162 ft (50 m)

Color

Black

Shelf Life

3 years in unopened containers

Storage

Store in a cool, dry place (50 to 90 ˚F [10 to 32 ˚C]) away from direct sunlight, flame, or other hazards.

Features

Features	Benefits
• High strength to weight ratio	Can add significant strength to a structure without adding significant dead load
• Excellent resistance to creep and fatigue	Withstands sustained and cyclic load conditions
• Extremely durable	Extremely resistant to a wide range of environmental conditions
• Easy installation	Can be installed quickly, even in areas of limited access
• Low aesthetic impact	Easy to conceal, will not significantly change existing member dimensions, will form around complex surfaces

Where to Use

APPLICATION

- Increase load bearing capacity of concrete beams, slabs, walls and columns
- Improve the seismic ductility of concrete columns
- Improve the seismic response of concrete beam-column connections, shear walls and collector elements
- Improve the seismic performance of masonry shear walls and in-fill walls
- Restore structural capacity to damaged or deteriorated concrete structures
- Increase the strength of concrete pipes, silos, tanks, chimneys and tunnels
- Substitute reinforcing steel mistakenly omitted in the construction of concrete and masonry structures
- Improve the blast resistance of concrete and masonry structures
- Strengthening of some steel and timber structures

LOCATION

- Vertical
- Horizontal
- Exterior
- Interior

SUBSTRATE

- Concrete
- Masonry
- Timber
- Steel

Protection and Repair

Technical Data

Composition

MBrace® CF 130 is composed of a dense network of high strength carbon fibers held in a unidirectional alignment with a light thermoplastic glass fiber cross weave yarn

Physical Properties

PROPERTY	REQUIREMENT
Fiber Material	High Strength Carbon
Fiber Tensile Strength	720 ksi (4950 MPa)
Areal Weight	0.062 lb/ft^2 [300 g/m^2]
Fabric Width	20 inch [500 mm]
Nominal Thickness, t_f (1)	0.0065 in/ply [0.165 mm/ply]

Functional Properties

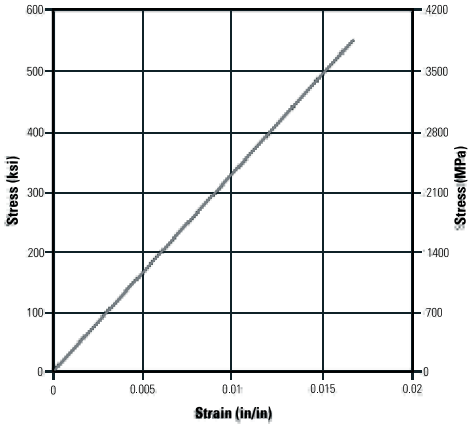
PROPERTY	REQUIREMENT
CTE	-0.21·10^{-6}/°F (-0.38·10^{-6}/°C
Thermal Conductivity	65.1-Btu·in/hr·ft^2·°F (9.38-W/m·K)
Electrical Resistivity	1.6·10^{-3}Ω·cm

0° Tensile Properties (2,3)

PROPERTY	REQUIREMENT
Ultimate Tensile Strength, f^*_{fu}	550 ksi [3800 MPa]
Tensile Modulus, E_f	33000 ksi [227 GPa]
Ultimate Tensile Strength per Unit Width, $f^*_{fu}\,t_f$	3.57 kips/in/ply [0.625 kN/mm/ply]
Tensile Modulus per Unit Width, $E_f\,t_f$	215 kips/in/ply [38 kN/mm/ply]
Ultimate Rupture Strain, ε^*_{fu}	1.67%

90° Tensile Properties (2,4)

PROPERTY	REQUIREMENT
Ultimate Tensile Strength	0
Tensile Modulus	0
Ultimate Rupture Strain	n/a



NOTES:

(1) The nominal fabric thickness is based on the total area of fibers (only) in a unit width. From experience, the actual cured thickness of a single ply laminate (fibers plus saturating resins) is 0.020 to 0.040 in (0.6 to 1.0 mm).

(2) The tensile properties given are those to be used for design. These values are derived by testing cured laminates (per ASTM D3039) and dividing the resulting strength and modulus per unit width by the nominal fabric thickness.

(3) The 0° direction denotes the direction along the length of the fabric.

(4) The 90° direction denotes the direction along the width of the fabric.

How to Apply

Surface Preparation

1. MBrace® CF 130 is applied to surfaces treated with MBrace® Primer, MBrace® Putty and MBrace® Saturant. Consult the data sheets for these materials for additional details.

Application

MBrace® CF 130 is only applied as a component of the MBrace® System.

1. The MBrace® CF 130 material should be cut to the proper dimensions (dimensions will vary based on project requirements) using heavy duty shears or a utility knife.

2. Cut sections of MBrace® CF 130 can be temporarily stored by carefully rolling fabric into a 12 inch (600 mm) (approximate) roll. Do not fold or crease the fabric. Fabric shoul dbe kept free of dust, oils, moisture and other contaminants at all times.

3. Apply the MBrace® CF 130 fabric directly into uncured MBrace® Saturant applied on the substrate. There is no need to "pre-wet" the MBrace® CF 130 fabric with MBrace® Saturant prior to applying the fabric against the substrate.

4. Using a rib roller or squeegee, press the fabric against the substrate until visual signs of MBrace® Saturant are observed bleeding through the fabric. The rib roller or squeegee should only be run along the direction of the primary fibers in the fabric.

5. Apply a layer of MBrace® Saturant over the top of the MBrace® CF 130 fabric to completely encapsulate the fabric. Consult with the MBrace® Saturant data sheet on details for applying MBrace® Saturant.

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult an BASF representative for additional information. Visit us on the web for the most current product information and news: www.BASFBuildingSystems.com.

For Best Performance

- Use caution when applying MBrace® CF 130 around sensitize electrical equipment. Carbon fiber filaments can become airborne, infiltrate electrical equipment and cause electrical shorts.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Health and Safety

MBRACE® CF 130

Warning

MBrace® Fiber Reinforcements contain carbon, glass, and/or aramid fibers, MBrace® CF 130 contains carbon and glass fibers. While handling MBrace® Fiber Reinforcements CF 130, wear appropriate work clothing to minimize contact. Product Material Safety Data Sheets (MSDS) are available and should be consulted and on hand whenever handling these products. These products are for professional and industrial use only and
are only installed by trained and qualified applicators. Trained applicators must follow installation instructions.

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